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SOUTHERN MEDICAL ASSOCIATION
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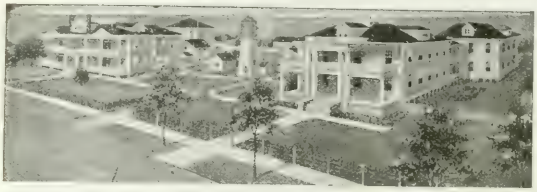

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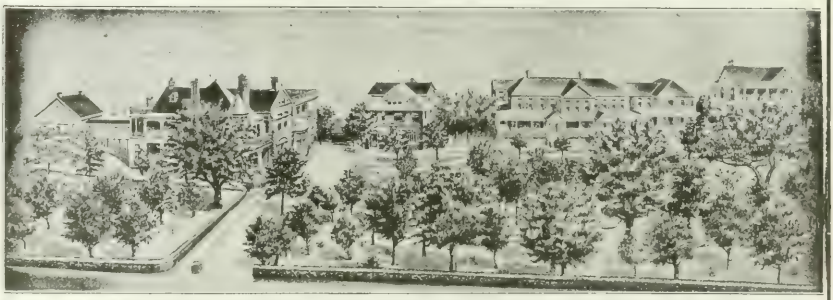

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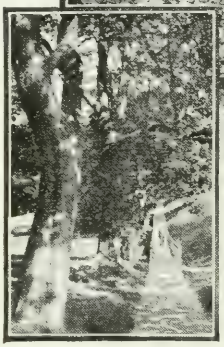

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Bismuth subcarbonate	300 parts
Zinc Oxide	300 parts
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SOUTHERN MEDICAL JOURNAL

JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION

PUBLISHED MONTHLY AT BIRMINGHAM, ALABAMA

Volume XIV AUGUST 1921 Number 8

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

CHRONIC MYOCARDITIS AND ITS MANAGEMENT*

BY HENRY A. CHRISTIAN, M. D.,
Boston, Mass.

Chronic myocarditis is a very common condition; in my wards into which children are not admitted, it is a trifle more frequent than any other form of chronic cardiac disease. What do we understand as the condition to which we give the name chronic myocarditis? It is primarily a disturbance of the heart muscle resulting in cardiac insufficiency. The term is not used in the sense of a chronic inflammatory change in the myocardium but in a functional sense to connote a heart muscle unable to function normally even though under the microscope we may not be able to detect any change in muscle fibres or interstitial tissue. However, in a certain per cent of cases muscle fibres do show degenerative changes and interstitial tissue is infiltrated or increased or both.

Chronic myocarditis seems to be a condition frequently unrecognized. Often it is given other diagnostic names. Most often perhaps it is called mitral insufficiency. In reality mitral insufficiency in the sense of organically diseased mitral leaflets is very rare except in association with a deforming change which produces both stenosis and insufficiency of the valve and this rarely develops after 40, the age after which chronic myocarditis is commonest.

To my mind a great deal of confusion and error would be saved if the physician dropped the term mitral insufficiency altogether as a diagnostic term. When used, the term suggests that the primary or chief defect in the heart results from a leak at the mitral valve. What really has happened is that the weakened heart muscle has allowed the valve orifice to dilate and a regurgitant murmur is the result. The important disturbance is in the heart muscle. This is not to say that a real organic mitral insufficiency does not occur, but that it is so rare that few errors would be made if the term was not used at all.

I suspect that very often many of you say a patient has mitral insufficiency because you hear a systolic murmur, loud in the apex region and transmitted well out into the axilla. Some of these people with apex systolic murmurs have normal hearts; and others have diseased hearts. Few, if any, have a genuine organic mitral insufficiency; hence when you make that diagnosis in an organic sense you are wrong in about 99% of the cases. War experience with soldiers has emphasized the fallacy of saying mitral insufficiency on the sole basis of hearing a systolic murmur. Many physicians seem not to have realized that often they had unduly frightened patients or had limited them to a totally unnecessary restriction of activity on the basis of a diagnosis of a valvular heart disease that did not exist.

*Read in the Section on Medicine, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

War experience showed that the average physician had very crude ideas as to heart disease and its diagnosis. So I urge you to give up saying that a patient has mitral insufficiency, meaning the heart is incompetent because of a leaking mitral valve. What you should understand is that, when there are evidences of cardiac incompetence, usually the mitral valve leaks because the heart muscle is insufficient, and so the murmur you hear indicates myocardial disease. This you should diagnose as chronic myocarditis.

Again, you must realize that a loud systolic murmur may be heard at the apex when, so far as can be determined, neither valve nor muscle is in any sense abnormal. Finally, it needs to be kept in mind that a highly diseased heart may be entirely devoid of murmurs and even may not show any demonstrable enlargement. In other words, the systolic murmur is of very little diagnostic or prognostic significance.

How then are we to diagnose chronic myocarditis? Mainly by the evidences of a weakened circulation apart from the heart as shown in various portions of the body both by symptoms and physical signs. Of these two, with the exception of edema, symptoms are by far the most important. The symptoms are just those you get when the normal heart is made to do much work: breathlessness, rapid pulse, precordial distress, only with chronic myocarditis they are produced by very little exertion or come on spontaneously. With these generally go an enlargement of the heart and usually a mitral systolic murmur.

In almost all of the patients of this group cardiac symptoms have developed after 40 and a history of true rheumatism is lacking. Except for a syphilitic aortitis causing aortic insufficiency practically all cardiac murmurs in those with cardiac symptoms developing after 40 arise from myocardial, not from valvular changes; in other words, they indicate chronic myocarditis as here defined.

Treatment in chronic myocarditis as a rule is very satisfactory. Many of these patients have auricular fibrillation and in this group as emphasized by Sir James Mackenzie, digitalis gives its most brilliant results. I wish to emphasize, however, that often when the heart rythm is entirely regular in cases of chronic myocarditis therapeutic results are no less brilliant.

In treatment there are three main reliances: rest, digitalis and diuretics. How simple sounds the recommendation for rest, but how often does the practitioner err in his idea of rest. Rest must be real and maintained. Comfortably in bed is the first recommendation. This means a properly arranged back rest on which the patient can sleep satisfactorily while still propped up at the most comfortable angle. Morphin frequently is of inestimable value in attaining rest, particularly in the first night of treatment. Remember, rest for the cardiac patient needs to be as complete and as continuous as possible. Eating, bowel movements, bathing, all need to be reduced to the lowest possible minimum of exertion. Be sure to show your patient how to rest in this sense and explain in great detail to whomever cares for the patient just what the patient may or may not do in the way of exertion. Do not assume that a trained nurse, if one be in attendance, knows by reason of her diploma from a training school. Nurses, unless they have been particularly trained in the care of heart cases, are very apt to err in many ways in looking after a cardiac case. Many nurses leave hospitals trained as surgical nurses and know but little of the care of medical cases. If you have not previously done so in connection with some other cardiac case go over with the nurse in minutest detail how you want the patient managed.

Digitalis in this group of cases is capable of accomplishing wonders up to the time the heart muscle becomes unable to respond further. Much has been written of late in regard to preparations and methods of administration of digitalis and those phases of the subject are too familiar to you to require reiteration. At your meeting of last year there was a most excellent paper on this subject by Dr. Canby Robinson, which you would do well to re-read. To me there is but one essential in digitalis therapy: know what the results are that you should get and give sufficient of the drug to produce these results. The exact dosage depends on the potency of the drug used. It is immaterial whether you follow the method of one

or two large doses or follow the method of smaller repeated doses. The former brings quicker comfort to the patient; the latter is possibly safer if your patient is not under close observation. The end result of both is the same.

Digitalis in adequate dosage should produce slowing of the pulse with decrease of the pulse deficit in case of fibrillation, diuresis when edema is present, decrease in dyspnea, and nausea and vomiting. One or the other of these changes may appear first. The appearance of any one is a sign for decreased dosage, the absence of all is evidence of insufficient dosage. The corollary to these statements is to give digitalis until you get one of these effects. In my experience the failure to give enough digitalis is a common error among physicians; to give too much is a rare mistake.

I have never experienced any difficulty in obtaining satisfactory digitalis effects from the simplest possible form of digitalis, untreated powdered leaves made into pills, provided the leaves are potent. To find this out you need but to test them on one of your cardiac patients; if you get good results ask your druggist to dispense that leaf to your patients until his supply gives out and when he gets a new supply of digitalis to send you a sample to test before you allow him to fill your digitalis prescriptions. In this simple way you can test for yourself the potency of the digitalis you use and form your own estimate of the proper dosage to get results. Local cooperation in this matter between fellow practitioners would be of great value; the digitalis tested by one will give the same results for all when given in the same dosage.

In my own hospital in close proximity to the laboratories of a medical school my digitalis usually has been tested by the animal method and the dosage used in my patients is based on these results, but actual dependence is placed on how the drug works in the patient. We often use new forms of digitalis and new methods of giving the drug, for it is our duty to strive to improve medical practice, but we have found simple powdered leaves very satisfactory. If that is true of a highly organized hospital with laboratory facilities and sufficient means to purchase the more expensive therapeutic preparations if they are preferable, there would seem to be little reason for the general practitioner to be trying new, much advertised digitalis preparations, highly vaunted by the representative of a drug house. It is better to await the careful repeated observations and mature judgment of a large group of the leaders of medicine before giving up the simple pharmacopeal forms of digitalis. I use powdered leaves because I get satisfactory results from that form of digitalis. I am pretty sure I should get the same results from a good tincture or a good infusion.

Finally, for the waterlogged cardiac, a diuretic causes prompt diuresis. I get best results with theophyllin and almost as good with theobromin sodiosalicylate. The best way to use them is to give them after two days of digitalis therapy in two doses, one early in the morning and the other at noon time; of theophyllin 0.2 gram or 3 grains or of theobromin sodiosalicylate 0.5 gram or 7½ grains, and repeat this dosage on the third day if necessary. In this way frequently a tremendous diuresis is started and the patient rapidly loses his edema. I have seen as much as 60 pounds of water lost in ten days as the result of this way of treating a waterlogged cardiac. Whether or not you get a diuresis depends in large part on the functional integrity of the kidney. If the edema is, in the main, cardiac in origin, the diuresis occurs; if it is mainly renal in origin, no diuresis results. It is inadvisable to give diuretics continuously; better results follow intermittent dosage.

The more I see of cardiac cases, the less am I impressed with the need of more than simple laxative drugs to produce an easy bowel movement. Vigorous catharsis, to my mind, should be omitted from the treatment. Diet should be simple, easily chewed and digestible. Fluids should be moderately restricted. The total intake of food should be moderate. There is no need for any special form of diet or for any particular types of dietary restriction.

The guiding signs for the treatment of chronic myocarditis lie mainly in the effects on symptoms and on edema, pulse

and respiration. Little change, except slowing in rate, will be noted in the heart. Physical examination of the heart is the least important thing in guiding your treatment of a cardiac case.

A course of treatment should not be ended until the patient is free from edema in his legs, over his sacrum and at the bases of his lungs. Until then he needs the judicious mingling of rest and digitalis. Often it is advisable to prolong digitalis treatment for many weeks by continuing small doses after a definite digitalis effect has been obtained from larger doses.

I know of no condition in which the immediate results of treatment are more satisfactory than in chronic myocarditis. Eventually the heart will give out, for it is a progressive disease whose advance we know not how to stop. Relapses are inevitable. How you manage the patient will have much to do with the frequency of relapses; how you treat the patient in the relapses will have much effect on their severity and greatly influence the comfort of the patient. On both depends the lease of life and comfortable efficiency of the patient.

DISCUSSION

Dr. G. Canby Robinson, Baltimore, Md.—I agree fully with Dr. Christian's general conception of chronic myocarditis. I feel that it is a functional disturbance of the heart muscle, and prefer the term myocardial insufficiency, but that is a matter of choice, after all. We cannot determine the presence of myocardial insufficiency by the autopsy findings. Cabot has stated that 32 per cent of the cases that had been diagnosed as myocarditis in the Massachusetts General Hospital proved to be wrongly diagnosed at autopsy. But that is a point of view I feel we cannot accept. We are considering cases with insufficient hearts and that insufficiency must be considered as referable to the heart muscle when other causes of the insufficiency can be ruled out. If a heart is insufficient as judged particularly by the symptoms; if aortic insufficiency and stenosis and mitral stenosis are not present, then we are safe in concluding that the case is one of chronic myocarditis or of myocardial insufficiency.

It is very interesting that it is necessary to go over very often the importance of disregarding a murmur which is heard at the apex during systole. Austin Flint, in his paper published in 1862 on cardiac murmurs, said that the man is fortunate who escapes the stethoscope of the auscultator, as many men are doomed to years of invalidism because a murmur has been discovered. That was in one of the earliest papers on cardiac murmurs in American literature, and yet it is a point that has to be recalled time and again. I think it is a natural human reaction that we have to combat in disregarding a systolic murmur at the apex in the diagnosis, and particularly in the prognosis, of heart disease.

In regard to the diagnosis, as Dr. Christian says, symptoms are, after all, the points that lead to the diagnosis of cardiac insufficiency. If we have diagnosed cardiac insufficiency, then, of course, the next point is to determine just where the trouble lies, and we must take into consideration the changes in the valve when they can be definitely determined as structural changes due to definite causes.

Other signs of cardiac insufficiency are, first of all, dilatation. The normal heart does not dilate to any extent even though the valves are damaged. It is evidence of incapacity. Second, cardiac irregularity due to auricular fibrillation is an important point in the diagnosis of myocardial insufficiency, because nearly all cases that show auricular fibrillation leading to a constantly irregular pulse, and a constantly irregular heart action, are cases of myocarditis. Third, is the the detection of pulsus alternans, where the beats, although regular, alternate in force; a condition that may be determined by applying the blood pressure instrument and listening carefully over the brachial artery when the sounds first appear. When pulsus alternans is present, sounds are heard at first only with every other cardiac contraction. Pulsus alternans is evidence that the muscle is contracting unequally beat by beat and alternating in force, and it is a very important and easily determined sign of myocardial insufficiency.

In regard to the treatment, I feel that everything Dr. Christian has said is absolutely right.

In regard to the use of digitalis, three factors must be taken into consideration: potency, absorption and dosage. In regard to potency, it is valuable to be able to standardize the drug by means of the laboratory animal, but the drug can be standardized perfectly satisfactorily by careful observation of patients to whom the drug is being administered, particularly those cases of auricular fibrillation which will definitely respond. If by careful observation one knows the minimum dose that will produce a definite effect in a patient, then the potency of the drug can be well determined by actual use in a patient.

I wish also to emphasize the importance of the after-care of the patient. Very frequently a change of employment may be followed with very beneficial effects. The work put upon the heart must be kept within the limits of his ability to respond to increased demands. This is perhaps the most essential factor in the treatment of heart disease.

Dr. Lewellys F. Barker, Baltimore, Md.—The condition described by Dr. Christian and discussed by Dr. Canby Robinson, namely, circulatory insufficiency due to myocardial weakness and independent of organic valvular lesions, is, indeed, very common. The symptoms and signs to which it gives rise are, as he has pointed out, often misinterpreted, the nature of the underlying process often misunderstood, and the pa-

tients suffering from it all too frequently mismanaged.

Dr. Christian has laid great stress, and rightly, upon the subjective symptoms of failure of the heart muscle. They are the same in the form of circulatory insufficiency that he has described as they are in chronic circulatory insufficiency in which true inflammatory disease of the valves has preceded the cardiac failure. In both groups of cases, the circulatory insufficiency depends upon the failing heart muscle, and a failing heart muscle that develops slowly, no matter whether it be primary or secondary, reveals itself subjectively always in approximately the same way, namely, in the initial stages, by shortness of breath on slight exertion or after a hearty meal; and often by a feeling of oppression in the region of the heart, or by a feeling of fullness of the skin about the ankles due to beginning edema.

It is the age and the history of the patient and the objective findings, as Dr. Christian has pointed out, that permit us to distinguish this particular form of failing heart muscle from other forms that yield the same or similar subjective symptoms. Thus, the majority of the patients of the group under consideration are past middle life and have not suffered from a preceding endocarditis. Though the heart is usually enlarged and, as a rule, a systolic murmur is audible at the apex, both these physical signs are due to failure of the heart muscle itself. The enfeebled heart muscle accounts for the dilatation of the ventricles and for the enlargement of the heart. There is also relaxation of the heart muscle around the mitral orifice and this results in widening of that orifice, inadequate valve closure, mitral regurgitation and a mitral systolic murmur, notwithstanding the fact that both cusps of the mitral valve may, anatomically, be entirely intact. Dr. Christian correctly states that this mitral murmur is often erroneously believed by practitioners to be due to endocarditic changes in the mitral valve cusps. One must, indeed, be very cautious in concluding that endocarditic changes have occurred in the mitral valve unless a mitral stenosis also exists, or the patient is known definitely to have suffered earlier from endocarditis. In the absence of signs of mitral stenosis, the majority of mitral systolic murmurs in the enlarged hearts met with in patients of middle and later life are due not to organic changes in the cusps of the mitral valve, but to mitral regurgitation dependent upon a widening of the mitral orifice due to relaxation of the heart muscle about it. This enfeeblement of the heart muscle, though sometimes the result of a true inflammation of the myocardium (myocarditis), is most often due, in my opinion, to a toxic or a degenerative change in the heart muscle, to cardiac overstrain as in chronic arterial hypertension, or to impairment of the nutrition of the myocardium owing to coronary sclerosis.

I am in entire accord with Dr. Christian in his management of the patient whose myocardial disorder has resulted in circulatory insufficiency. He has told us clearly how to set about to secure a readaptation: complete rest, both physical and psychical, quiet sleep, five small meals rather than three large ones and the avoidance of constipation as well as of violent purgation go far toward lessening, temporarily, the work that the heart muscle has to do. Digitalis, properly administered, slows the heart rate, improves the per minute output of blood into the aorta. The overfullness of the veins recedes and the tendency to passive congestion and edema is overcome. The powdered leaf made into pills as a form of digitalis administration is everywhere accessible and I can support all that Dr. Christian has said in favor of it. If a quick result is desired, a half of a milligram of strophanthin intramuscularly and repeated every twelve hours for two or three days may be advantageous. If the drug be given intravenously, doses of one quarter of a milligram may be safely used.

The results of a carefully planned and properly conducted treatment of the form of chronic circulatory insufficiency under consideration are most gratifying. There are but few conditions met with by clinicians in which timely intervention is better rewarded.

Dr. E. C. Thrash, Atlanta, Ga.—I am delighted to hear Dr. Christian emphasize the point that we should not stress murmurs too much, and that murmurs often do not mean cardiac insufficiency, and that there is often cardiac insufficiency without murmurs. We are often too loath to make a diagnosis of a heart lesion unless we hear a murmur. I see no reason why the word cardiopathy should not apply when we refer to complex insufficiencies. It would be more applicable, it seems to me, than myocarditis.

I have learned a great deal from observing postinfluenzal conditions in reference to the heart. These lesions are not infections directly, but in my opinion they are the result of infections at remote points. In other words, they are intoxications, and these intoxications are certainly more frequently of bacterial than of chemical origin. These heart lesions are a process of combustion; that is, in acute infections you get albuminous degeneration of the heart structures, of the vascular structures, of the kidneys, lungs, liver and other parenchyma throughout the body. This process may recur in chronic as well as in acute lesions and chronic myocarditis might be described as a chronic albuminous degeneration of the muscle structure. The muscle structure, to say the least, is affected by intoxications, and destructive processes, and inroads are made upon the parenchyma of the heart by these products.

We make our diagnosis in these cases by testing the endurance but often we have to do it by exclusion. The point has been made to observe shortness of breath. I want to say in reference to that, do not depend too much upon shortness of breath as indicating a myocardial lesion because you can get shortness of breath from diseases of other organs, so you need to rule out carefully everything else that might bring about this. To the patient this means a great deal.

Another point I want to make is that naturally you would think blood pressure would help a great deal. In other words, with myocardial weakness there is a low blood pressure, but this is not true. The lesion affects the heart, the vascular system, and probably the kidneys, and the tension may become high, and although the blood pressure is high, the heart may be insufficient. In other words, a condition where you

need a pressure of 160, the heart is giving a pressure of only 120, and you still have a myocardial insufficiency. I have gone astray on that very thing in several instances. I took the blood pressure and assumed that I had pretty good heart action, but in studying the case more carefully, where I should have 160, 170 or 180 pressure, I would only have 130 with my patient suffering from an alarming insufficiency.

Dr. Allan Eustis, New Orleans, La.—Only two weeks ago I was going over my records when one of my postgraduate students said to me, "You have a great many cases of myocarditis." I have been observing this condition, especially for the last nine years, on account of an experience in my own family in which a case of simple myocardial degeneration was diagnosed as one of valvular heart disease and the patient given six months to live. He had a phenolsulphonephthalein test of 20, albuminuria, and all sorts of casts. He is now a man in his 80th year; his blood pressure is 150; he has absolutely no murmur; his heart is three centimeters smaller than it was, and he is younger today than he was twenty years ago.

I have been paying particular attention to these cases of myocardial degeneration, classifying them under the general term myocarditis. It is surprising to me how often they are overlooked by the general practitioner, and while many of the speakers have spoken especially of dyspnea, I want to call attention to a certain type which may manifest cardiac decompensation only in insufficiency of the liver, in gastric insufficiency, and engorgement of the liver, failure of the heart muscle being reflected on the liver's circulation more often than on the pulmonic circulation.

Dr. Robinson brought out an important point in diagnosis, and that is the pulsus alternans which can be observed by any general practitioner with the ordinary blood pressure apparatus. You will find one systolic beat going through at 160, and not find regular beats until 130 or 120.

There is one other point I want to impress upon the Section, and it is this: Always tell our patients when they have heart disease, and impress upon them the importance of guarding against overexertion. I recall one case I believe I could have saved from a fatality by timely warning against undue exertion. This man was 56 years of age. He ran two or three blocks in order to catch a train. With his grip, he landed on the platform in a condition of marked dyspnea, with fatal dilatation of the heart. When we recognize these cases, let us warn patients against such overexertion.

Dr. Thompson Frazer, Asheville, N. C.—I was glad to hear what Dr. Christian said with reference to digitalis preparations. I have always felt that it was more important to know how much digitalis is used than the preparation which the patient was given.

I had a case recently of myocarditis with auricular fibrillation, with a heart rate of 120, and pulse rate of 80, so that there was a deficit of 40 beats, and a very irregular pulse; and the polygraphic tracings showed a difference in force and frequency of the beats. This man also had distention of the veins of the neck, some edema, and some rales at the base. I put him to bed, and put him under mild hypnotics, and then started him on digitalis. I ordered the tincture in 50 minim doses and got no results. I was rather surprised at that. I questioned the nurse and found she was giving 50 drop doses. Then I took 50 minims and put it in a dropper and got 140 drops, so that the patient was getting about 18 minims at a dose rather than 50. An important thing is to give enough digitalis, and the virtue of the different preparations lies simply in the fact that they contain more digitalis.

The infusion is a popular preparation. A teaspoonful to a dram of that represents 8 or 9 minims of the tincture, and it is quite common to give several drams in one dose for those who use the infusion, yet doses of 30 or 40 minims of the tincture are regarded as large doses. As a matter of fact, we can give for a short time dram doses without danger.

Dr. Elsworth S. Smith, St. Louis, Mo.—There is just one point I want to make, although the subject has been pretty well covered, and that is, to call attention to the effect of hypertension in the development of these decompensated hearts, so called chronic myocarditis. If we assume the only plausible explanation of high tension that it is due to the accumulation of pressor substances in the blood that produce vaso constriction and raise blood pressure, then the heart in laboring againts high tension for long periods thereby becomes incompetent.

If, therefore, we can get a case before arteriosclerosis, as a result of the hypertension, has permanently fixed the arterial tree at a normal calibre, we can eliminate pressor substances from the blood through placing the patient on a low protein diet, and do away with infection, or exclude some endocrine disorder, we can save strain on the heart muscle by reducing blood pressure, and that is a great factor in reestablishing the compensation.

It used to be considered bad practice ever to reduce blood pressure, but in our clinic we have studied several hundred cases with hypertension without disturbance of cardiac compensation, where we have been able to reduce blood pressure to save the heart in the compensated cases. We have also helped compensation in the decompensated cases through lowering of blood pressure.

With reference to the treatment, there is one drug that has served me very well in these cases where digitalis fails, especially where it is not well borne by the digestive tract, and that is sodium-benzoate of caffein, given hypodermically 1 to 4 grains. I have gotten excellent results in the establishment of diuresis by this remedy and in improving the condition of cardiac compensation.

Just one word about the syphilitic heart. I do not want to go on record as saying that syphilis is a very frequent cause of so-called chronic myocarditis, but I do believe that a good percentage of these cases are due to lues, and I believe if we look for it, and in cases that resist ordinary methods, if we add antisyphilitic treatment, we will get better results with combined treatment.

I have had this experience: I have seen cases where the etiological factor seemed very plain in cases that were of rheumatic origin, and where the patients did not do well, until after they were put on cardiac combined with antisyphilitic treatment. I do not think a negative Wassermann ought to exclude syphilis of the heart.

Dr. J. B. McElroy, Memphis, Tenn.—I was thinking whether or not we should make a distinction between the disease which Dr. Christian has described and a similar clinical picture which results from so-called hypertensive cardiovascular disease. There is a distinction between these conditions. Without going into that, I simply would call attention to this one fact, that myocardial insufficiency is a good clinical diagnosis for these conditions, and I want to impress upon you the fact that whether it is due to a degenerative heart muscle or what not, whether the result of secondary hypertension, the same treatment Dr. Christian has given for the one is applicable to the other. Do not be afraid to give digitalis in hypertension cases with myocardial insufficiency.

With respect to the remarks of the gentleman who just sat down, I have tried out different methods of treatment in a great many of these cases, and I have seen no result whatever from antisyphilitic treatment in these cases of myocardial insufficiency. But that is not definite proof, because after a syphilitic aortitis has passed over the aortic valves, we can do very little more for these patients than for those whom we know have lesions due to syphilis.

Dr. H. M. Folkes, Biloxi, Miss.—During the past seventeen years it has been my fortune to be in charge of the Jefferson Davis Home at Biloxi, Mississippi, and during that time there have been admitted to the home about 700 inmates. Of this number about 75 have been women, and the remainder men. None of the inmates admitted have been under 65 years of age. I want to say very frankly that during this entire period I have seen very few cases of valvular heart disease. A great many of them have what I term mild or light myocardial degeneration. I frankly do not believe that syphilis plays any part whatsoever in the production of this condition. If that were true, then syphilis does not apply in a great many cases. In some of the points mentioned I failed to hear anything said relative to the pulse. I find, in addition to dyspnea and weakness, and a slight edema in the evening, a very pronounced irregularity or inequality and weakness of the pulse. A thing that struck me principally in this condition has been the fact that these people are able to live so long.

Just a few days ago I lost an old gentleman from a fall. He fell and fractured his hip. He was admitted seventeen years ago. He was the second inmate admitted to the home, I find in looking over the records. We can say by way of admission that every one of these people had life insurance examinations made on them. When any inmate gets sick I go back to the records and check up to see whether I am right or wrong. Unfortunately in a place like this home we are not permitted to make post-mortem examination. The home is founded on sentiment, and when I brought up this matter of making post-mortem examinations, the whole board threw up their hands and said they would not stand for it. This old gentleman, when he was admitted, seventeen years ago, was 69 years of age. A diagnosis was made then of weakness of the heart muscle or myocardial degeneration. Albumin was found in his urine; his pulse was 96 and put down as irregular, intermittent and weak. He weighed 100 pounds. He lived in that home comfortably for seventeen years. Very few of the women, as I said a moment ago, have shown indications of these conditions.

I want to speak of the point as to whether tobacco plays any part in the progress of these cases. I am in earnest about this. I do not think smoking does. Every one of these old chaps chew tobacco, and they chew it day and night.

As to the treatment, rest is the essential indication of course. I want to differ with my friends a little bit about mild purgation. One grain of calomel has done wonders for these people. I only rely upon digitalis whenever the condition becomes very pronounced. Lots of these old people come into the home almost moribund. Some of them have died at the station before they got to the home.

In reference to a leaking valve being of probably small significance in the young, I would warn you to be very slow in accepting any such doctrine, for in my life insurance observation extending over many years, I find that a true valvular leak is essentially a substandard risk.

Just one word more, and that is about minute doses of morphin. At times nothing seems to help these patients so much as this measure.

Dr. Frank A. Jones, Memphis, Tenn.—Dr. Christian's paper has certainly given us some food for deliberate thought. Taking the paper as a whole, nearly any cardiologist will agree with him, but there are one or two points I should like to take up with reference to the relationship of valvular murmurs to myocardial degeneration.

Dr. Christian takes the position that these cases of myocarditis are functional in nature. May I ask in these degenerative processes in the myocardium from whatever cause, what the condition is operating to produce the perverted function? Surely the basis here of functional disturbance is pathologic changes. I can't conceive of the condition being purely functional where there is so much pathology. I suppose we can apply the present day pathological term, functional pathology. Dr. Christian does not attach much importance to cardiac murmurs in these myocardial troubles. He states that mitral insufficiency is very rare until after 40, and that when seen at this age it is seldom due to endocarditis, the results of a streptococcic heart following or accompanying inflammatory rheumatism. On this point I do not think internists at large will concur with Dr. Christian. In fact I have always believed and still teach that mitral insufficiency is the valvular lesion of young

adults, the result in numbers of instances, of rheumatic endocarditis. We all know that the majority of cases of aortic insufficiency in men past 40 is due to syphilis. We all know that these murmurs wherever located in these myocardial troubles are of but little consequence and have nothing to do with the prognosis and treatment. In a paper I read in May before the Mississippi State Medical Association and published in the Sept. 14 issue of the *New York Medical Journal* I endeavored to place the value of a murmur in these cardiac states in the right relationship. Any trained cardiologist knows that young practitioners are frequently misled in attaching too much importance to the murmur. Now as to mitral insufficiency being rare before 40 and not due to inflammatory rheumatism, let's present a hypothetical case: given a child who is attacked with violent tonsillitis and not diphtheria. In a few days after the onset of tonsillitis develops polyarthritis with the accompanying sweats and fever. We watch the child day in and day out and after a certain period we find that the apex beat becomes irritable and diffused, that there is a little tendency to dyspnea. We have been giving him the salicylates for their effects relative to the cardiac state and the joint condition. Finally in the process of our physical examination we find the apex beat more diffused and more irritable and becoming displaced. We detect a loud blowing systolic murmur over the apex. Perhaps the tonsillitis has been the focal entrance. We are justified in making a diagnosis of endocarditis as a part of a general infection together with the joint trouble. We treat the child through perhaps five or six weeks. The murmur does not disappear. It is easily transmitted into the axilla and heard distinctively posteriorly. In due time the child goes on to what we assume to be recovery, but he still has the blowing murmur, still transmitted and still distinctive. I have seen numbers of these cases fifteen or twenty years ago with their murmurs still with them and the apex beat still diffused and out of line. This I should call an endocarditis mitral insufficiency. May I ask Dr. Christian what diagnosis he would make from the description related?

I note that particular stress has been laid on dyspnea as a symptom in the essayist's paper and in the discussions that followed. Nothing has been said about hydrothorax as a factor in its production. Unless we are careful we miss the presence of fluid in the pleural sack. Too many physicians are prone to attribute all the dyspnea to the myocardial insufficiency. We should look in these marked respiratory disturbances in myocardial degeneration for hydrothorax. I know of no condition that is more universally overlooked. I see some of my students in the audience now who missed it in the amphitheater clinics. Much has been said about digitalis by the essayist and by others who have preceded me. In my experience it is a lion in extravagant claims and a lamb in action. It is the most vaunted therapeutic remedy in the whole domain of medicine. Perhaps I am a hopeless non-conformist as to its value.

Dr. Christian (closing).—In regard to Dr. Jones' question, why does the heart muscle fail, or why does it not function? I do not know. There is much written in explanation, but it explains very little. The heart is large; it does not work. In many cases there is no organic explanation of the fact, but the fact remains that it does not work. We do not know why.

In regard to mitral insufficiency before 40, I have discussed in this paper cases that occur after 40. What I have said is applicable mainly to people over 40.

The case Dr. Jones cites is one in which, in the majority of cases, in my judgment the patient is on the way to a mitral stenosis and insufficiency, but the stenosis has not become marked enough to produce physical signs. Whether that heart is leaking at that particular time at the mitral valve because the orifice is too large, or because the leaflets are already somewhat contracted, I do not know. I know of no way of distinguishing between the two. With that history of infection of a rheumatic type, I should expect most of these cases to be on the road to mitral stenosis, and that is borne out by the fact that in post-mortem examination we rarely see organic lesions of the mitral valve without signs in the valve of both an inefficient opening and inefficient closure of the valve.

How can we tell whether a systolic murmur before 40, or particularly in younger people, is significant or of very little significance? It seems to me, that the history is the most valuable thing. With a history of rheumatism it is not safe to neglect entirely your systolic murmur because it may be the first indication of what subsequently is going to be a mitral stenosis, but it may be fifteen years or more before the mitral stenosis is evident.

Somebody asked why I did not say more about the pulse. There was a certain method in my madness on that point, because the irregular pulse has been stressed so much that most of you have the idea that, if a patient has not auricular fibrillation, you ought not to give digitalis because you will not get any results. That has not been my experience. I differ with Dr. Robinson and my friend Sir James Mackenzie and many others in that respect. In fact, I have seen many brilliant results in this group of cases with a heart which is perfectly regular to observation by the finger and stethoscope, and which is perfectly normal in rhythm by the electrocardiograph. By the way, this is not so very important in these cases. The finger, the stethoscope, and the brain are worth a great deal more to you in this type. They will disclose in the majority of instances whether the heart is fibrillating or not.

THE TREATMENT OF NEUROSYPHILIS*†

By Albert Keidel, M.D.,
Baltimore, Md.

In discussing the treatment of neurosyphilis I want to emphasize the importance of recognizing this condition in its incipiency, and from this viewpoint to consider the actual therapeutic attack on the disease as an asymptomatic one, rather than as a complication arising late in the disease, basing the treatment on the theory that the best way to cure a condition is to prevent it.

Although it is well known that the invasion of the central nervous system occurs early in syphilis, it is quite apparent that little practical advantage is taken of this most significant fact. One is led to suspect therefore that the profession at large has little exact information concerning the incidence of this invasion and its actual organic disease.

Those of us particularly interested in the domain of syphilology recognize that the central nervous system is invaded by the treponemes in perhaps from 25 to 35 per cent of the cases. The question of neural strains need not be considered here, the important point being that the organisms reach the vital center very early, perhaps even before the development of the primary lesion, but at the latest during the period of general invasion, preceding the appearance of secondary manifestations. The only exceptions to this are the few cases which develop neurosyphilis as the result of invasion due to the subsequent generalization of the infection, such as may follow the breaking down of a pre-existing focus, later in the disease.

These facts have developed from study of the cerebrospinal fluid of early syphilis following routine lumbar punctures, a procedure not only of the greatest significance in the early recognition of neurosyphilis, but of importance as the first step in the treatment of it. The ease with which lumbar puncture can be performed and when properly done the freedom from danger which the operation entails combine to make it an indispensible part of the study and treatment of every case of syphilis. As it is the only means for the early diagnosis of asymptomatic neurosyphilis, and as its significance has been tragically overlooked by the major portion of the profession in dealing with syphilis, I suggest its general employment by the profession at large as a means of cutting down the incidence of symptomatic neurosyphilis. Lest I be misunderstood, however, I repeat that the safety of the procedure depends upon proper technique, and I may add that this is not difficult either to acquire or to carry out. From the standpoint of our present knowledge of these matters I consider it a dereliction from duty for any physician to neglect this early investigation of the cerebro-spinal fluid in any case of syphilis regardless of the type of manifestations of the disease which the patient presents.

The importance of lumbar puncture, therefore, as a routine procedure cannot be too greatly stressed. It will increase the incidence of neurosyphilis in your practice and provide the opportunity for intensification of treatment at the most propitious time for aborting neurosyphilis. Subsequent repeated punctures during the period of treatment will indicate progress made and determine those cases which fail to respond favorably. Let it be your ambition to recognize asymptomatic neurosyphilis so that your treatment may to a greater extent prevent tabes, paresis and other forms of cerebrospinal syphilis in which the chances of successful treatment are far from being as good. And let it not be forgotten that a negative spinal fluid at one period in the infection, does not preclude the possibility of a subsequent invasion of the central nervous system, particularly when the early treatment has been inadequate.

It is perhaps not an extravagance to state that syphilis is the most inadequately treated disease of our day. The onus of this statement rests on patients and physicians alike, but the responsibility is largely with physicians. Ignorance born of optimism in the layman does not jus-

*From the Syphilis Clinic of the Medical Department of the Johns Hopkins Hospital.

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tify complacent indifference in the medical man. He must conceive it his duty to educate as well as to treat the syphilitic. He must be guided in the treatment by the teachings of only those qualified to impart this information, and if he has no special knowledge of the subject, he should not attempt it at all. In accepting the care of these cases he should shoulder the responsibility of the end result, and his responsibility cannot be terminated by the patient's inability to pay. When one pauses to consider the great mass of syphilitics in the country whose treatment is cut short by their inability to meet the expense of private management, content in a fictitious sense of security because of the absence of pain and obvious manifestations of their condition, one cannot avoid a feeling that great injustice is being done. Unless the treatment of syphilis is carried through to an adequate conclusion, of what value to the patient is the symptomatic cure? It is certainly not worth the inconvenience, loss of time, and expense to which the patient is put. And what about the influence of such methods of treatment on the status of his infection? To quote from Swift (1):

"This phenomenon of increased severity noted in relapsing lesions of the skin occurs also in the central nervous system, and explains the occurrence of meningitis with cranial nerve paralysis in many of the inadequately treated cases of secondary syphilis. In these patients the greater part of the infecting organism has been destroyed by the remarkable spirocheticidal action of arspenamin. This has, moreover been accomplished so rapidly that the usual tissue immunity which develops as a result of prolonged contact between parasite and host is lacking. As a result a small focus of spirochetes, tucked away safely in the tissues of the central nervous system, thus escaping the spirocheticidal action of the arsphenamin, can develop in the susceptible host with great rapidity and severity. The severity of the meningitis is evidenced by the cerebrospinal fluid, which shows a marked pleocytosis, considerable globulin excess, and usually a strongly positive Wassermann reaction. The Wassermann reaction in the blood is frequently negative, showing how well the active syphilis is limited to the central nervous system. The failure to recognize this possibility of active meningitis in the early stages of syphilis with a negative Wassermann reaction in the blood, may result in the failure to resume treatment at a most critical period. It should be emphasized that the development of this condition is due to inadequate intensive treatment and that a few doses of arsphenamin, without continued treatment, may result in more severe nervous manifestations than if milder therapy had been applied."

(1) Swift, Homer F., Transaction of the Congress of American Physicians and Surgeons, 1916, X pp. 26-27.

As it may seem that I discuss the inadequate treatment of early syphilis with too much feeling, let me say that it has been my lot to meet in the consultation room principally this type of patients, the victims of a pernicious practice, not only robbed of their opportunity to escape the full penalty of an earlier indiscretion perhaps, but too often subjected to greater suffering and danger through no greater fault of theirs than that of misplaced confidence. The incidence of neurosyphilis in this class is very high, and many of them are in an advanced stage when they apply for relief.

It must be borne in mind that syphilis in all its varied forms is always one and the same disease. Its clinical manifestations are visible evidence of response of the human defense mechanism to the irritating action of treponemes. The treatment of syphilis has for its object a cure of the disease, which can be accomplished only by complete obliteration of the infection. It is therefore essentially a sterilizing treatment in which we employ drugs which are treponemicides against a rather easily killed organism, located in the tissues, within a wide distribution. So far as we know, death of the organisms is certain to follow contact with the treponemicides, provided the latter are present in sufficient concentration, and contact is sufficiently sustained. The production and maintenance of this contact is the problem of treatment. It follows therefore that the therapy of neurosyphilis is essentially the same as that of general syphilis, reinforced by whatever special procedures best subserve the fundamental requirements. It is also obvious that if one wishes to discuss a treatment for neurosyphilis one must begin with the general treatment of the disease.

Practically, the curative value of routine antisyphilic treatment in cases of early neurosyphilis is conclusively illustrated by the low incidence of involvement of this system, in extremely well treated cases, with an increasing in-

cidence in groups of cases less well treated. Its incidence varies in inverse proportions to the intensity and duration of early treatment. Surveys indicate that an incidence of from 15 to 20 per cent in poorly treated cases may be reduced from one to two per cent in energetically and long treated cases, without the employment of special methods of treatment. The actual incidence of neurosyphilis in the clinics of today is from 15 to 20 per cent, making intraspinal treatment necessary in some 10 to 15 per cent instead of in 1 to 2 per cent.

In spite of criticism to the contrary we must have definite plans of procedure in the management of syphilis. A plan should be based on information of a positive nature only, never on conjecture. It should be sufficiently elastic to permit of minor changes to suit changing conditions, personal idiosyncracies, and special emergencies, and at the same time consistent in the important essentials, so that the results of treatment may be compared with the average as a standard and serve as a criterion of cure. It is desirable that there should be several plans, as no one can say today what will eventually be the best treatment available with our present means, and comparisons will be of value.

The plan of treatment I employ consists of courses of arsphenamin intravenously alternating with courses of mercury by inunctions. Injections of arsphenamin are given at intervals of from five to seven days and continued for from six to twelve doses. The amount of the drug for each injection, usually four decigrams, is regulated by the patient's weight and tolerance, as are also the number of injections and the intervals between them. Inunctions are continued daily without intermission for from two to three months, combined with iodids by mouth, the amount of both being kept just within the patient's limit of tolerance. The proper dietetic and setting up measures are instituted and the whole treatment adjusted to the patient's tolerance as shown by the general nutritional condition. Progress is estimated by studies of the blood at weekly and monthly intervals and of the spinal fluid at intervals which depend on the condition found to be present.

The first lumbar puncture is made after treatment is begun and if negative findings are obtained is not repeated until the end of treatment is reached. The duration of treatment varies with the rate at which the disease responds to it. In general this is estimated by the time required for the blood Wassermann to become negative, after which event treatment is continued for one year.

Under this routine plan of treatment no additional procedures are necessary in the cases showing central nervous system invasion, except that lumbar punctures are made at intervals approximating six weeks for purposes of observation, and especial care is taken to keep the intensity of the treatment well up to the limit of tolerance, although not of course, to the extent of diminishing the patient's weight. The patient's endurance is reinforced by the liberal addition of milk and eggs to the ordinary diet.

If, under this routine management, abnormalities in the spinal fluid persist to the extent that no further progress results, indicating that the treatment is not reaching the foci of infection in the central nervous tissues, interspinal treatment is begun.

Intraspinal therapy is made necessary by the inaccessibility of foci of infection to substances in the blood stream. The treponemes appear to elect situations remote from blood stream influences. They are tissue organisms because the cultural conditions in the lymphatic system, particularly the intercellular spaces, are more favorable to their existence. Herein lies the main obstacle to successful treatment. The added factor of vascularitis and perivascularitis induced by the presence of the organisms greatly increases this difficulty. In general it may be stated that failure of general intensive treatment to cure neurosyphilis may be due to the degree of perivascularitis present at the time treatment is begun, which explains the greater success in that form of treatment early in the disease. It is also probably due to this factor that differences of opinion arise as to the relative merits of ordinary antisyphilic treatment and the more direct methods of the intraspinal type. If the permeability of the

vessel walls is not too greatly interfered with by the pervascular reaction, substances in the blood may escape into the tissues in sufficient concentration to reach the treponemes and obliterate them. If this were not the case, no amount of intravenous medication would suffice.

The application of intraspinal therapy therefore should be restricted to those early cases, which prove refractory to treatment by the ordinary routes early in the infection, and to all cases with organic pathologic changes produced by long contact of the organism with the tissues. Among the later cases treatment by the ordinary routes will often succeed in obliterating serologic abnormalities, with marked clinical improvement, but the possibility of isolated foci of infection remaining undisturbed in areas not involved in the clinical picture makes the addition of intraspinal therapy desirable, as an adjunct to the general treatment. In estimating the degree to which intraspinal treatment should be resorted to, one should be guided by the differential diagnosis and by the amount and rate of response to ordinary treatment.

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DISCUSSION

Dr. W. G. Somerville, Memphis, Tenn.—Dr. Keidel very rightly laid great stress on impressing upon the patient the fact that he or she, as the case may be, must be followed up: that we must not consider, after giving a few doses of arsphenamin for a short period, and then finding a negative Wassermann, that the patient is cured. The Wassermann reaction is only a symptom of neurosyphilis, and we must not depend too much on this one symptom. We should rely a great deal on the clinical findings, and among the most important and early clinical findings of neurosyphilis, in my opinion, are the pupillary signs Sometimes they are the first symptoms which are present. We know that a great many cases of neurosyphilis deny ever having the disease. They are, in fact, ignorant of it; they have never had treatment early in the disease, and we have no way of suspecting that they had syphilis except by the clinical findings, unless we make a routine Wassermann of the blood and spinal fluid in all cases.

The most important pupillary signs are the irregularity of the pupil, the inequality of the pupil, and the slow reaction to light. That is sometimes the only sign we find. We may suspect syphilis, examine the blood, and find a negative Wassermann: but by making a careful examination of the pupil and other neurological signs, we suspect syphilis in spite of a negative Wassermann of the blood. Then is the time we should make an examination of the spinal fluid, but we may be disappointed again in finding a negative Wassermann. I think one reason for this is, that too small a quantity of spinal fluid is used. It may be reported negative with one-tenth and two-tenths c.c. of spinal fluid, whereas if we used a larger quantity we should get a positive Wassermann of the spinal fluid. If the spinal fluid gives a negative Wassermann reaction, we must rely to a great extent on the increase of the cell count. I think that is just as important as the Wassermann reaction, and that is one of the earliest signs. We find it sometimes a few months after the initial lesion, and it may be the only sign found.

There is another class of cerebrospinal syphilis which the doctor did not mention especially, namely, tabes and general paresis. Therefore so much more important is the early recognition of neurosyphilis in order to prevent these types of disease, because we consider general paresis almost hopeless to treat. Here we find frequently a negative blood Wassermann, and in the early stage no clinical symptoms except the pupillary signs.

As to the treatment, I shall mention briefly that I have used the intraspinal treatment, both mercurialized serum and arsphenamin introduced with spinal fluid, but have gotten no better results, and a great deal more discomfort, than by using arsphenamin intravenously, and at the same time withdrawing the spinal fluid. According to the method of Dr. Dercum, the spinal fluid should be withdrawn, a large quantity of it, and arsphenamin should be given at the same time intravenously. It will have a much better effect than when introduced into the canal.

Dr. Lewis M. Gaines, Atlanta, Ga.—If I understood Dr. Keidel correctly, he made a plea for prevention of neurosyphilis rather than the treatment of it. Therefore, he is making an appeal to the general practitioner and to the syphilologist or urologist to treat these cases in such a way that they will not appear before the neurologist later on.

It is only recently that even neurologists have realized the value of a routine examination of the spinal fluid in all cases, and not only a first examination of the spinal fluid but repeated examinations of it. So now this matter of spinal fluid examinations is being carried still further in every case of syphilis when the disease is first contracted, and the patient on the manifestation of the first sign should have a spinal fluid examination and repeated treatment.

Dr. Keidel has referred in his paper to intraspinal treatment in such a way as to lead me to believe that he uses almost wholly intraspinal treatment, but he does not mention the method he uses. There have been such a large number of methods used, I should be interested to know what his particular method is at the present time. In my own experience I disregard all methods except that of spinal drainage in the way in which the last speaker alluded to it. I find the results have been just as good, and I think even better, and certainly the discomfort is far less. Patients who have been subjected to the old methods of putting various solutions into their spinal canals have suffered an immense

amount of discomfort, with questionable improvement.

I should like to inquire of Dr. Keidel what his opinion is of neoarsphenamin as contrasted with arsphenamin. The use of neoarsphenamin is far more simple, but I should like his opinion concerning its therapeutic value.

Dr. M. L. Graves, Galveston, Texas.—I became interested in this problem a good many years ago, and my interest is unabated at the present time. I began quite early spinal puncture and efforts at examination and classification of the spinal fluid, and as soon as Swift and Ellis announced their method of intraspinal injections, I immediately did that in a large number of cases, later using the Ogilvie modification of the Swift-Ellis method.

As late as a year ago I had occasion to compare some of my own results with those of Dr. John A. Fordyce, of New York City, and I found we were in entire agreement as to the results that had been obtained, except Dr. Fordyce had gotten better results than I had obtained by reason of his more persistent treatment. In certain types of neurosyphilis I have felt that the intraspinal method has given better results than any other form of treatment. Not even drainage mentioned by the doctor following arsphenamin injections, has proven so valuable. I have seen cases of well pronounced general paresis which had remissions of the disease lasting from one to four years following repeated intraspinal injections, and I have used as many as 40 or 50 intraspinal injections, both arsphenamin and neoarsphenamin and a mercurialized serum, and in a few cases I used plain bichlorid of mercury, reinjecting through the spinal fluid in which I dissolved it. It was painful in small doses of 1/50th of a grain, and I have abandoned that method of using it.

After a fairly good observation extending over a number of years in the treatment of neurosyphilis, I have made efforts to bring to the attention of the profession the necessity of spinal fluid examinations and the importance of vigorous treatment of these cases. I have come to the conclusion that no case of tertiary syphilis, as mentioned by Dr. Roberts, is ever cured. There may be an arrest of the progress of the disease, and the patient may die of some intercurrent disease, which is quite frequent, but so far as actual cure of the disease is concerned, it is well nigh impossible. I have come to feel that the great majority of cases of secondary syphilis are never cured; that they are arrested at times, and remissions of the disease will continue over a period of a few years, but a large number of patients who have secondary syphilis, both in the public clinic and in private clinics, do not take the treatment sufficiently long. I can count on the fingers of my two hands patients in good circumstances who will take antisyphilitic treatment for a number of years and have observed them with repeated analyses of the spinal fluid. After the symptoms have subsided they no longer come. And then public legislation, which we enacted in our state, attempting to force the reporting of the venereal diseases, has really become sterile. The statute is not observed by the profession, and it has driven patients away from medical attention. In the public clinics, those in which the United States Government is furnishing the means and the materials for injection, these patients do not keep coming, so that the disease is constantly being spread, and it is my judgment it is slowly on the increase. Those of us who live in the south recognize the prevalence of the disease among the negroes. For instance, in those of hospital population the incidence of syphilis is very large. My associate (Dr. McNeil) went over 2,000 negroes admitted to the John Seeley Hospital, and 50 per cent of them were found to be infected with syphilis. You cannot sterilize that number of people by modern methods. The only way is by educational systems and treatment of the primary lesion.

Dr. William Litterer, Nashville, Tenn.—Dr. Keidel emphasizes the importance of examinations of the spinal fluid in suspected luetic cases. To this I heartily agree. There are many cases that never give a history of lues and in just those cases will you most often find a negative blood with a positive spinal fluid. I am reminded of a case I saw last year which to my mind, is exceedingly suggestive of a syphilitic process being solely confined to the central nervous system in which this process had no direct relation to the general system. This individual contracted lues twelve years ago. He received two years of antisyphilitic treatment by another physician and was discharged by him as cured. Ten years later he developed cerebrospinal syphilis. His blood was negative, but spinal fluid showed a four plus positive, with increase in globulin, albumen and cell count. Ten intravenous arsphenamins were given at weekly intervals. During that time three intraspinals (Ogilvie technique) were administered. The patient refused to take further treatment for two months. During this interval he was exposed to a known luetic, and in nineteen days from exposure, a typical chancre developed on the prepuse. The dark field revealed many spirochetes, and sections were made of the excised chancre which demonstrated the treponemata in tissue by the Levaditi method. The excised area healed readily after a single dose of arsphenamin.

I do not believe the chancre was a redux one. If such were the case, then it certainly was a remarkable coincidence. The patient died six months later from thrombosis.

Although it is not germain to Dr. Keidel's paper, I should like for him to tell us how he treats his cases. I have not obtained wholly satisfactory results from spinal drainage alone. I use the modified Ogilvie technique. Draw off as much spinal fluid as you can and inject from twelve to seventeen c.c. of the fortified arsphenaminized serum. I think arsphenamin is certainly far superior to the neo preparation. There are many physicians who think that neoarsphenamin and arsphenamin are practically the same thing. But they are entirely different products.

Dr. E. H. Martin, Hot Springs, Ark.—I cannot agree with the essayist's remarks as to the complete curability of syphilis. I agree with the author of the paper that an examination of the spinal fluid should be made in every case before treatment can be considered sufficient.

The essayist did not tell us how he was going to decide when a patient was cured. We know very well that a negative Wassermann is worthless after an uncertain amount of treatment and, in fact, in many cases that have never had treatment. In latent syphilis the Wassermann becomes negative in many cases regardless of treatment. There is only one conclusive evidence of cures having been made and that is that in many such cases reinfections have taken place. I think that we may also have reinfection in cases of cerebrospinal syphilis when the blood is entirely free from infection, but that is very rare.

Patients have been coming to Hot Springs for many years and hundreds of thousands of them have been treated with mercury to the utmost. The same can be said of patients in every center but more especially in Germany and France. These patients after the most thorough mercurial treatment extending over years have failed to furnish any noticeable number of reinfections. From this we gather that mercury did not entirely cure any of these millions; in fact, that mercury has never directly cured anybody of syphilis.

Ten years ago we began using arsphenamin, adding to it the routine mercury treatment as used in Hot Springs, by inunction and subcutaneous injection and intravenous injection, as these methods had all been in vogue for several years. Patients began to come back with reinfections. We were greatly astonished and I wish to say right here that you cannot mistake a typical reinfection. The chancre is often typical but there is nothing except the early secondary rash which is like itself. These reinfections were also proved by the microscope and by the new presence of the positive Wassermann. A recrudescence at the site of the old chancre might be mistaken for a chancre, but it would not be followed by a secondary rash. It is useless to speak of such cases as super-infections. If super-infections were possible they would have occurred in some cases after the millions of said mercurial treatments. Such cases are still occurring and I still regard them as reinfections and as proof that the patient has been cured.

It naturally occurred to me that for the first time in my life I was curing syphilis and I was using both arsphenamin and mercury. I also realized that I had not previously cured any cases with mercury, and so concluded that it was useless to use two drugs in the treatment of a disease, one of which would cure it and one of which would not. I therefore stopped using mercury and for the past nine years have used mercury only in those cases where the patient or the home physician request it or where arsphenamin cannot be used. About one patient out of several hundred will suffer from an arsenical rash or dermatitis after having received several doses of arsphenamin. If treatment in these cases is pushed, very regrettable results may occur but if they are allowed to go for several months without arsphenamin they may be able to continue treatment until cured without a recurrence of the dermatitis. During this interval I think it wise to keep them on mercury in some form or on mixed treatment so as to keep the disease at a standstill if possible until the curative treatment may be resumed.

During the past nine years I have treated many thousands of patients with arsphenamin alone. We have had just as good and satisfactory results and just as large a percentage of reinfections as I had when I used both drugs.

Dr. Keidel (closing).—Dr. Gaines stated my position exactly when he said the object of my paper was to emphasize the early treatment of general syphilis as a means of preventing later neurosyphilis. That is exactly the point I want to make. I discussed the treatment of syphilis almost entirely from the point of view of the general routine treatment, and I tried to keep out all discussion as to whether one form of arsphenamin is better than another, and the relative merits of mercury and arsphenamin, because I think I said any plan that we employ should be one that is founded on very positive information. The great trouble with all of us has been that we are inclined to accept the view of the protagonist with one particular method, while another man advocates some other thing, and there have been so many suggestions as to the proper way to give this and that drug, we have no uniform method of treatment. My idea is, and I discussed this with other men who are particularly interested in the treatment of syphilis, that we should have a fairly well defined plan of treatment for the control of syphilis; that this plan should be followed constantly and consistently irrespective of opinions that may be offered. It is very essential to stick to a plan of treatment until you have gathered a sufficient number of patients for a sufficient length of time to determine the value of the method. If that is done, we shall ultimately acquire positive information about the treatment of syphilis. That has not been done heretofore, and although the therapy of syphilis has changed tremendously since the introduction of arsphenamin, it can hardly be said that we are much further ahead in the treatment of syphilis than they were at that time, because we do not know the relative value of our drugs, nor do we know what is going to be the end result of our treatment, and that brings up the question of cure. It is absolutely impossible for any one to state with accuracy, with scientific definiteness, when a patient is cured. That can probably never be determined unless the patient is brought to the autopsy table and a careful survey of his tissues made to determine the presence or absence of late syphilitic lesions, and the presence of Treponema pallidum.

The occurrence of a chancre in a patient who has previously had syphilis and has been treated for it, is not necessarily a reinfection, and my feeling is that these things are usually, as we see them, superinfections. You have infection in an individual who has probably small residual foci of infection in other parts of the body, lying there practically inactive because one of the forces, the treponeme, is only slightly irritating. It may remain in foci without setting up any degree of inflammation.

I could not discuss intelligently all the questions which were raised by the various members who have discussed the paper. For instance, to

go into a discussion of the relative merits of neoarsphenamin and arsphenamin would lead us into volumes on that subject. In general, I think the tendency today is to discard neoarsphenamin. As a matter of fact, that should be the tendency. The ease with which neoarsphenamin can be employed and the slight degree of reaction immediately following the injection, makes it more or less a matter of choice to the great majority of men. However, I agree with Dr. Martin that the employment of arsphenamin, rather than neoarsphenamin is greatly to be desired, and I should also say that neoarsphenamin is not so free from danger as is generally supposed. I should like to mention the case of a patient who recently died following two or three injections of neoarsphenamin of only two-tenths of a gram. She was somewhat hypersensitive to the drug, and very small doses of neoarsphenamin were given, yet she died of acute arsenical poisoning. In her case a little of the treatment was doing absolutely no good as she had very active lesions in the aorta.

As far as methods of treatment are concerned, intraspinal treatment is a large subject. In answer to the gentleman who asked my opinion as to these methods I would suggest that he read an article which will appear in the Johns Hopkins Bulletin written by myself and colleague Dr. Moore in which we discuss fully these various methods and the mechanism by which they operate.

SOME REMARKS ON GASTRIC LAVAGE AND THE PROPER MEDICAMENTS THEREIN*

By George M. Niles, Ph.G., M.D., Atlanta, Ga.

Gastric lavage, as a therapeutic procedure, has had its ups and downs like many other more or less well directed efforts.

Since it was first scientifically championed by Kusmaul, its use has waxed and waned through successive decades until at present it has won its proper and definite place; and, though not universally advocated, is at least respected.

How the pendulum of medical thought may violently ocillate until it settles into a correct movement, if such be the fortunate outcome, will remind us of the former wholesale indictment and consequent wholesale extirpation of tonsils, the orgy of exodontia, entailing the loss of thousands of good and inoffensive teeth, and perhaps the present endocrine adventures.

In like manner gastric lavage has been sadly abused by some of its over zealous friends, and this abuse has built up against it many violent prejudices, which will take years to overcome. On the other hand, when judiciously employed, under proper conditions and with expert technic, it will yield gratifying results, accompanied by a minimum of discomfort.

Permit me to mention some conditions in which gastric lavage should not be generally considered as advisable:

Pregnancy, if advanced beyond the fifth month.

Organic heart disease, with broken compensation. To this might be added so-called cardiac neuroses, angina pectoris, real or pseudo myocarditis, or any condition where the heart seems decidedly below par.

Aneurysm of any of the large arteries.

Recent hemorrhages. This may include hemorrhage from the stomach, intestines, lungs, bladder, uterus, apoplexies, or hemorrhagic infarctions.

Advanced pulmonary tuberculosis, or advanced pulmonary emphysema with bronchitis.

Advanced arteriosclerosis.

Advanced cachexia from any cause.

Evidences of marked erosions of the gastric mucosa, either malignant or non-malignant.

Acute febrile conditions.

Those rare and peculiar conditions, where upon the slightest touch of the tube against the epiglottis the larynx spasmodically closes and the patient becomes blue.

The indications which render expedient the employment of gastric lavage are in the main as follows:

In all cases of poisoning by the stomach. Some clinicians, with an excess of caution, have advised against the use of this procedure after the ingestion of acids or corrosive alkalies. This caution should be disregarded, for the good to be attained by washing out the poison, before it can be absorbed or sent onward into the small intestine, will immeasurably overbalance any supposed danger of perforation by the tube.

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In acute vomiting. Very often a lavage, repeated two or three times daily for just a few days, will exert an almost magic effect in this trying class of cases.

In chronic gastritis, with an excessive production and collection of mucus in the stomach. Though this statement may excite dissent from some, it may justly be claimed that gastric lavage, with suitable astringents, antifermentatives, or sedatives, when not employed too often, will in many instances bring about marked improvement, diminishing stomach distress, aiding the nutrition, clearing up the skin, and in other ways exercising a real and tangible effect upon the dyspeptic and discouraged patient.

In dilatation of the stomach (atonic type), with impaired motor power, delayed evacuation and fermentation.

In dilatation of the stomach (stenotic type), with motor insufficiency, gastritis and periodic vomiting. In no class of cases is gastric lavage more fruitful of benefit than in these two last conditions.

In acute dilatation of the stomach from any cause.

In postoperative vomiting, especially reversed peristalsis. Lavage in such conditions must be employed with caution, and with the assent of the surgeon. I have, however, in more than one instance seen it apparently save patients, who without it would have probably died.

In postoperative intestinal paresis lavage may be used together with enteroclysis.

Under certain conditions lavage may be recommended in vomiting in peritonitis or in the presence of intestinal obstruction, but its advantage is problematical.

It is not necessary nor advisable to enter into a discussion of the technic or the various forms of apparatus for cleansing the stomach. Suffice it to say that brevity is a shining virtue, and every effort toward that end will be appreciated by the patient. Sometimes it is worth while at the first attempt to introduce and withdraw only a small amount of fluid, so as to permit the patient to discover that gastric lavage is not so horrible as pictured. Then, after the mental attitude has become more favorable, the lavage may be as thorough as desired.

The temperature of the fluid should be in the neighborhood of 100° to 105° F. Cold water is nearly always objectionable, and very hot water, apart from the danger of burns, makes the patient uncomfortably warm, sometimes bringing on faintness.

There are quite a number of medicaments, which may be appropriately used in the lavage water, and I shall mention some that in my judgment are the most helpful and rational. It would be impossible to name all that have been recommended, for some have been as freakish as the charms and philtres of the middle ages.

The medicament to be employed is of course governed by the gastric condition, whether there be irritation of the mucosa, atony, stagnation of the contents, fermentation, hyperacidity or hypoacidity, or abnormal states brought about by anatomic lesions, malignant or otherwise.

It is well to use plain water until the flow is established, and continue until the stomach is fairly clean. The medicated solution may then be introduced, followed by the plain water. Occasionally some medicated solution is left in the stomach at the close of the lavage.

Among the eligible agents are boric acid, simple salt, bicarbonate of soda, nitrate of silver, permanganate of potash, peroxide of hydrogen, carbolic acid, ichthyol, subnitrate of bismuth, light calcined magnesia, etc. Another preparation possessing a wide range of usefulness is the alkaline antiseptic liquid (national formulary), which is inexpensive, and adapted to nearly all fermentative states. Most of the proprietary preparations with high-sounding names and the various tints of the rainbow, are practically the same, differing only in the titles and coloring.

The operator should have on a table convenient to his hand a receptacle containing a half to one gallon of warm water. He should also have a smaller receptacle for the medicated fluid. There should be in easy reach calcined magnesia, bismuth, soda, or any other powder which may be indicated. All should be ready, for when the lavage is started it should be carried through expeditiously. To stop *in medias res* to look for something or com-

plete some unfinished preparation, is vexatious to both patient and physician.

Should there be an irritable condition of the gastric mucosa, calling for nitrate of silver, the pint receptacle may be filled with a 1:500 solution, which may be employed midway the lavage. Should there be a fermentative or stagnated state of the stomach, requiring efficient cleansing, either ichthyol, to a mahogany color, permanganate of potash, 1:1000, or alkaline antiseptic liquid may be incorporated in the medicated solution.

Should there be an extremely acid state of the stomach, there may be used in the larger receptacle either common salt, soda or calcined magnesia. The last named will not dissolve, but may be kept in suspension by agitation, and is most useful.

After the medicated fluid, plain water should follow, and the lavage should be continued until the water returns clear, unless there is a good reason for stopping.

At the close of the lavage it is often advisable to leave some agent in the stomach. In acid conditions with constipation, I frequently leave a funnel of water in which is placed one or more heaping teaspoonful of calcined magnesia. This not only neutralizes the present hyperacidity, but exerts a pleasant hydragogue effect in a short while. Should there be erosions of the gastric mucosa, I often leave in the stomach a liberal teaspoonful of bismuth mixed in half a funnel of water. As a routine solution the 1-1000 solution of permanganate of potash is a favorite with me.

The best time of day for gastric lavage is governed by circumstances. Unless it is to rid the stomach of undesirable contents, the lavage is best performed on an empty stomach, preferably before the first morning meal. In atonic conditions of this viscus, the lavage should be performed the last thing before the patient retires at night, as both the cleansing and rest do their respective parts. So far as practicable, the time should be so arranged that the patient will not lose the large part of a meal by lavage. Most of these individuals are illy nourished, and the loss of a liberal portion of a meal every one or two days constitutes quite a caloric item. It is always helpful, however, to have the stomach as empty of food as possible, for the washing out of great masses of undigested aliment before the purposeful lavage begins is provoking and time consuming.

The frequency with which lavage may be profitably and harmlessly repeated is a mooted question. In my opinion, unless there is a decided interference with the proper emptying of the stomach, whereby there is a fermenting residue present, a daily lavage is seldom wise. Many of these cases do better with lavage on alternate days. In the presence of hypersensitive gastric mucosa, lavage should be performed with caution and not too often.

In chronic gastritis, with excessive mucus, a lavage two or three times weekly is generally of aid. The "lavage habit" into which some patients lapse, is an unfortunate one. These individuals, having learned to use the tube themselves, and finding that the emptying of an over-distended stomach will bring relief from epigastric distress, make it a practice to hasten for the tube, and wash out the stomach with the first qualm. Some of these misguided sufferers wash out their stomachs from two to four times daily, bringing their bodies to the verge of caloric bankruptcy by their unwise zeal. It is allowable, under certain circumstances, to teach the patients how to administer to themselves a gastric lavage, when they live in isolated localities, or when it is impracticable to see the physician at the proper time. Such instruction should be leavened with caution, and the patient informed of the dangers that lie in wait for those who fly to the stomach-tube, not wisely but too often.

In conclusion, I may say that gastric lavage, employed for a definite purpose, under restrictions and in a deft manner may and should fill a worthy place in gastric therapeutics.

DISCUSSION

Dr. J. B. Fitts, Atlanta, Ga.—As the Doctor said, it is an unfortunate thing that a good therapeutic agent like this has been abused, and particularly is it abused by the patients themselves. This should be discouraged. The only type of patient that should be encouraged to use this method is the gastric retention case caused by partial pyloric stenosis.

Dr. Niles mentioned the value of this method in atonic cases. I do not think the use of lavage in this particular gastric condition is very widely

appreciated. I believe the use of lavage, the filling of the viscus frequently, will stimulate the circulatory fibres, which really is the seat of pathology in these marked atonic cases.

In the irritative gastric disorders we have obtained the best results with silver nitrate, 1:1000 solution. It is remarkable how these cases can be relieved by the use of silver nitrate, and it seems to be due to the fact that you actually cause an increased secretion of gastric mucus. You will notice frequently in ulcer cases that there is entire absence of gastric mucus, and I believe we really get good results because of the fact that this gastric mucus is protective. In using nitrate of silver it should be followed by thorough lavage with plain water to remove any that should remain. This method is preferable to the gastric spray of silver nitrate because some of the solution might be left.

Dr. Niles mentioned the use of the tube in acute dilatation. Recently we have obtained some good results in acute dilatation by keeping the pyloric tube *in situ* in these cases where they could tolerate it. They are relieved of any gas that remains and the stomach will drain a surprising amount of fluid. Rather than disturb them every two hours we let it remain *in situ* and frequently use a small syringe to extract the accumulated juices. By doing this every two or three hours you can obtain more improvement with less discomfort.

As to useful drugs in chronic gastritis, we find a good combination in powdered alum with soda and calcined magnesia. We have used this alternate mornings with good effect.

Dr. Julius Friedenwald, Baltimore, Md.—The duodenal tube is now used much more frequently, both for fractional analysis of the stomach contents as well as for duodenal alimentation. It affords us a very excellent means of thorough lavage of the stomach and is at the same time used with little difficulty to the patient. It rids him of the fear of swallowing the tube, and we believe that with the duodenal tube we can in most instances obtain quite as beneficial results and sometimes even better by washing with one of the various solutions noted by Dr. Niles, such as permanganate of potash. It is surprising to see how easily the patient will swallow this little tube and the very beneficial results that may be obtained.

Dr. Curran Pope, Louisville, Ky.—I agree with the last speaker that lavage as practiced through the duodenal tube is very much superior in many ways to that employed through the large tube. I have been very much interested in washing out the stomachs of those who suffer from chronic catarrhal conditions to find the influence of chloride of zinc upon the mucous membrane. You can, so far as my observation goes, wash the stomach repeatedly until the water comes back absolutely clear, and then if you will use a solution of chloride of zinc about two-tenths of a gram to 500 cc. of water you will find the water will almost immediately be filled with small plugs. We have no actual way of demonstrating how and why these plugs of mucus appear in the washings, but we have been constrained to offer the theory that the astringent action of the chloride of zinc upon the mucous membrane causes more or less contraction and expulsion of a certain amount of mucus that otherwise is contained in the glands. This is Lyons' opinion also. We have found, too, that a good deal of advantage is to be gained from studying these plugs of mucus, microscopically and bacteriologically. In fact, we have made a number of autogenous cultures from these plugs and have found the vaccines possess considerable value in the treatment of these cases.

Dr. A. L. Levin, New Orleans, La.—I wish to corroborate the statement of two former speakers who have used the duodenal tube. In the last six months we have been using for gastric lavage nothing else but that tube, but I have one of my own design that is superior in many respects to the Jutte tube, and I have adopted the nasal route instead of the oral. If you use it through the mouth there is excessive secretion and a tickling of the soft palate; by selecting the nasal route you entirely do away with that tickling and there is no struggling on the part of the patient and no discomfort whatever. It is superior to the Jutte tube because there is a velvet eye at the end, the openings are oval and twice as large, it is not necessary to use a stylet as with the Jutte tube, and the quality of the rubber is heavier. This facilitates introduction and makes it less likely to coil up itself in the stomach. We find it very easy and simple, and I think the old stomach tube should be put aside as a relic and used only in two conditions—in cases of poisoning, when we want to empty the stomach quickly and thoroughly, and where it is suspected that large particles of food are retained in the stomach.

To cover Dr. Niles' contraindication to the use of the tube, Dr. Simon has been in the habit of teaching his classes that in conditions where sudden rise of blood pressure is injurious the tube is contraindicated. I think that is a good point and covers everything, but in using my tube by the nasal route there is no discomfort and struggling and we can therefore use it safely without fear of a rise in blood pressure.

In surgery of the gall-bladder and gastrointestinal tract the surgeon can easily introduce the tube through the nose, and before the abdomen is closed, pull it into the duodenum. It was recently done in two of my cases of gastric ulcer with excellent results. By this method, you can introduce large quantities of liquid, and no Murphy drip is necessary. Also in removal of the gall-bladder where there is regurgitation of bile the tube can be kept in for several days and the nurse instructed to take out whatever fluid may accumulate every two or three hours.

Dr. John L. Jelks, Memphis, Tenn.—I wish to emphasize one point with reference to lavage: that is, in the acute dilatation following surgical procedure. I have had some unfortunate experience in my surgical work in this particular. I remember one poor woman who had an obstructed gut and for whom I was forced to perform a hurried colostomy. When I opened the abdomen, the stomach seemed to be the only content of the abdominal cavity. Of course a stomach tube was used, but that alone would not

suffice, the stomach had to be quite often emptied. I think in those cases after the emptying of the stomach that a lavage with hot water (contrary to the doctor's statement) has a stimulating and contracting effect upon the nerve and muscle supply; also the stimulating oils, such as the oil of cloves. I remember another case where after serious surgical procedure there was an acute dilatation of the stomach. I warned the special nurse and the interne not to let that happen again without giving me immediate notice, but the woman did suffer another acute dilatation of the stomach and when the stomach was emptied she collapsed. I think therefore that the stomach man can teach some of us surgeons just how and when and what to do in acute surgical dilitation of the stomach.

Dr. Seale Harris, Birmingham, Ala.—I think most of us as we have more experience in the treatment of gastric diseases are apt to use the stomach tube less than we did in our earlier years of practice. Gastric lavage certainly is a very important part in the treatment of gastric disease. Dr. Niles' paper brought out quite plainly the contraindications to the use of the stomach tube. It is as important for us to report our mistakes as our successes in the treatment of disease. I recall one case in my earlier years in gastroenterological work in which I was called in consultation with two physicians to see a woman about 40 years of age who had what they thought was toxic vomiting. These men had told her that they thought gastric lavage would relieve her. When I examined the woman, I heard no cardiac murmur and she was not profoundly prostrated, yet I felt it was not wise to use the tube in that case. But the physicians insisted that they had done everything else and it would probably help her, so I finally agreed. We attempted to insert the tube, and after a struggle of about a minute she dropped back dead. I am sure that she had a toxic condition and that there was degeneration of the heart muscle that could not be detected from examination of the patient. In these toxic conditions we should be very careful about using the stomach tube. The same is true in cases of hign blood pressure, general arteriosclerosis particularly. There have been several deaths reported from the use of the stomach tube under those conditions.

Just a word as to the use of nitrate of silver in gastric lavage. I have seen quite recently a young woman who has argyria, blue skin, from protracted use of nitrate of silver. I formerly used nitrate of silver in gastric lavage quite a good deal, but having seen this case and another in which probably the same thing had occurred some years ago, I am a little afraid to use it, and I think it is always well following it to use sodium chloride, which forms an insoluble chloride.

In the treatment of gastric ulcer, in those cases in which there is pylorospasm, or pyloric stenosis, the use of the stomach tube before retiring will give the patient a great deal of comfort and I think is helpful in healing the ulcer.

In 1895, at a meeting of the American Medical Association Dr. Fenton B. Turck, who has done some very bizarre things, reported some work he had done with dogs in the prevention of shock after surgical procedure. He used several dogs that had been given chloroform until they were apparently dead. He then inserted a stomach tube and used lavage with hot water, and it was remarkable how the dogs revived. He opened up the abdomen and had the stomach out where it could be seen. When he began to use the lavage the stomach appeared blue, but after a few moment's use of the hot water the stomach resumed its reddish hue, showing that circulation was being reestablished. I believe gastric lavage with hot water is an excellent thing in surgical shock. This method was formerly used frequently at the Mayo Clinic. The small tube may be inserted through the nose while the patient is under the influence of the anesthetic.

Dr. Levin has made a decided improvement on the Jutte tube. I think if it were a little bit larger there would be less danger of its curling up and coming back through the mouth.

As to the use of the stomach tube of the duodenal type, we find that patients take about a No. 21 or 22 French stomach tube quite as well as they do a duodenal tube that has a bulb on the end of it. Certainly it is quicker to use lavage with the larger tube. Articles of food come out easily and by a few words to reassure the patient, telling him just what he may expect when the tube first strikes the throat, that he may expect a feeling of suffocation, but that when the tube has passed that point there is no more discomfort, usually there is very little trouble. We have less trouble in using the small size stomach tube than we do with the Einhorn and other duodenal types with a metal capsule at the end.

Dr. J. C. Johnson, Atlanta, Ga.—I do not know of any more practical question before gastroenterologists, or before the medical profesison today than that of lavage for gastrointestinal trouble. The word "lavage" contemplates not only the introduction of medicaments, but the removal of any contents that might be there. I think it is unfortunate that lavage has fallen into disfavor with the profession, or a large part of it. It is unfortunate that the laity have a growing prejudice against it, and I do not believe that they are altogether to blame for that prejudice. One of the main objections to the method is the difficulty of introducing the tube. The method and the tube to be selected depends upon the aim you have in view, just as the surgeon selects his type of operation. You may want to use it one way in one case and a different way in another case. In one case you may want to use a remedy, and in another case no remedy. And in the same case you may use a small tube one time and a large tube the next. We must

have an open mind about it and treat the case just as you would write a prescription.

One cause of objection to gastric lavage is that the laity and a large part of the profession think all the gastroenterologist does is to wash out the stomach. The gist of the whole thing, the virtue of lavage, the indications for lavage, and the good results of lavage come from the tube you use, the reason you use it, the time you use it, and the purpose for which you use it.

Dr. A. W. Calloway, Asheville, N. C.—Doctor Niles stated that advanced pulmonic tuberculosis was one of the contraindications for lavage. Of course the danger would lie in the type of case. A hemorrhagic case in its primary stages, and of course an advanced case, would be subject to danger. As a matter of fact the large majority of pulmonary hemorrhages take place while the patient is lying quietly in bed, outside of a few single fatal ones. Of course it would be unfortunate if we use the stomach tube at a time when a blood vessel was soon to rupture from ulceration, but I see no reason why in tuberculosis that is either safely healed or in the early stages we may not use lavage when necessary. I have been doing this for a good many years, even in advanced cases, and while I am cautious, I have never yet seen a case of pulmonary hemorrhage follow the use of the stomach tube.

Dr. Niles (closing).—The reason I wrote a paper on this somewhat dry subject was, as Dr. Johnson expressed it, because gastric lavage to an extent has reached a stage of prejudice on the part of some of the profession and many of the laity, principally on account of inexpert technic in introducing the tube. Those who introduce the tube often are careful about it. They do not delegate it to an assistant or nurse, and they inflict a minimum of discomfort. I know doctors who have it done by a nurse or by some green assistant, and consequently the patients go through the tortures of the damned with it. Instead of being a matter of seconds it is a matter of minutes, which to the patient seems hours. Within the last week a man came to me who had had the tube introduced badly, and when I told him it would be necessary to do it again he demurred. I told him not to be afraid, but he came back with much trepidation. Fortunately, I got through with it easily and quickly, and when I had finished he looked up at me and said: "Doctor, I realize that when I had that tube introduced before I was in the hands of an amateur." If this had been done easily and quickly he would not have spoken of it as an "ordeal." It is as easy to do it rightly as wrongly, and if we give our patients unnecessary discomfort they will spread the evil tidings. I have read this paper to re-orient gastric lavage. It is an old subject that has been threshed out many times, but it is a good procedure. Why relegate it to the rear when we can get out of it relief for our patients? The main thing is for us to do our part in a quick and efficient manner.

PREVENTIVE PEDIATRICS IN THE SOUTH*

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The result of the draft examination demonstrated that a large number of men were unfit for military service on account of defects which, if they had been recognized and corrected in early life, would have added man power to our army. It was found that only fit man power can win a war or successfully man a nation. This has awakened renewed interest in the baby. He has therefore, been placed on a pedestal as the potential hope of a nation. Since the baby has come to be recognized as a national factor, the child, irrespective of social and financial standing, is to be given protection, in order that his efficiency, and in turn that of the nation, may be promoted.

This has given an impetus to the study of all phases of child life, especially the heretofore most neglected period, the pre-school age. The mother has usually cared for the baby until after his second molars. Now, having erupted his temporary teeth or on account of the advent of a new arrival, he graduates to a period of child life, only recently under any supervision. It was during this pre-school period that he was expected to have his childhood diseases. Tonsillitis, otitis media, toothache, and similar complaints were looked upon as the ills of early childhood; to be sympathized with, but not prevented. Having reached the age of six years, he now enters school, where he receives some supervision, inspection, examination, and discipline, but frequently too late to accomplish the greatest good for the future welfare of the child. Mental hygiene and the formation of proper health habits, so essential during this formative period of the child's life, have also been neglected.

The students of delinquency and criminology tell us that the present method of treating the class of citizens with which they deal is wrong. Rather than begin-

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ning at the starting point, the child, we now wait until he is beyond control, or a criminal: that, in childhood, where there is an inherited criminal taint, or a mental defect in a bad environment, coming events will so cast their shadow that with almost mathematical certainty, a criminal, delinquent, or a state charge may be prophesied. The crowded city, the apartment life, the indulgent parents, the neurotic mother and father are giving a problem in a progeny which must be looked upon as a social responsibility, an opportunity for the psychologist and psychiatrists to add an asset to the state rather than a liability. The child is the ward of the state if not cared for by the family. For best results these cases must be observed and classified early. In no class of cases is it so essential that a child should be born well, nor are preventive measures more applicable than here. It should be that only those of sound mind and body should be privileged to add a citizen to our community.

Mortality statistics and the result of the influence of preventive measures are available to warrant the statement that health is purchasable and that any community can fix its own death rate. That which is true of the whole is also applicable to a part, be it nation, state, municipality, or family. As one-fifth of the population deals with infancy and childhood, the need of efficient, constructive child welfare for all is apparent.

Forces have been at work for years, but only recently has national and world-wide interest arisen. Now, national, municipal, and lay organizations are keenly alert and active. Woman is earning and should receive national recognition, and she will force probably her first demand, that of the proper health protection for her baby and the education of her child, to qualify him for equal rights in our democracy.

The doctor has faced this problem in many ways. The health officers, if selected for merit, are enthusiastic. Many pediatricians are limiting their efforts to preventive pediatrics, which is child welfare in private practice. Many doctors are interested, and many are but passive. There is a flood of potential energy in every community needing only the medical mind to direct it for the improvement of child life. If the medical profession does not harness and direct this energy, it will be done either by the nursing profession or lay organizations. The public is alive to preventive measures, public and private. It will be done, and nothing should stem the tide of the flood of interest in child life, but for efficiency, it must be properly directed. Who shall assume control, the doctor, nurse, or lay organizations?

There are four governmental departments in Washington doing child welfare work: the Treasury Department through the United States Public Health Service, Department of Agriculture, through the States Relations Service, the Department of Labor through the Children's Bureau, the Department of Interior through the Bureau of Education, and in addition, the Red Cross. I understand there are in the National Government some 46 Government agencies asking Congress for money for health work, many having some child welfare program; of these 36 are now doing health work. There are about 130 lay organizations having measures influencing child life. Is there any wonder that there is overlapping and consequently friction? As this work is barely at its inception, how can efficient and harmonious work be done without a head responsible? Would not Congress have more respect for this and all other health measures if under a department of health? If we had a National Department of Health under a secretary or cabinet officer, with a bureau of child welfare, there would then be a clearing house and distributing center for all information, plans and advice. Through this bureau, each section could plan its own problem. The state, under the national organization, would act as an advisor, aiding in educational propaganda and stimulating work and interest; assisting in solving local problems, as each community has its own requirements.

I wrote to the secretaries of health of all the states in the Southern Medical Association, asking for the result of their work and the outline of their program. Of the sixteen states, eleven had active or tentative child welfare programs, one state making a survey. Four I have not heard from, and they are not on the list furnished by the Children's Bureau. Over

half of the states have a Children's Division and are planning constructive work. Six of the states have their division under a nurse. While we cannot proceed without the nurse, I cannot believe that her efficiency or the best interest of the department can be fostered by her playing the major role. On the state's present budget, it is either this or no department, but it will take an unusual woman to tell a doctor what he can or should do. The state board of health must let the doctor feel that the nurse, if continued as the director of the division of Child Hygiene and Public Health Nursing, is only a temporary arrangement due to lack of funds. It should be made clear that the division of Child Hygiene, or a better term Preventive Pediatrics, can best be, and will be, when funds are available, under a trained physician. In his community the doctor must stand either for or against. With the proper machinery, organized medicine, which he respects, behind the movement, and the local direction of his county medical society's committee on public health and legislation, he will no doubt give the cooperation necessary to advance the work, which will make for a better condition in our Southland.

A great advance has been made to give the doctor of tomorrow a preventive viewpoint. The American Pediatric Society has recommended and outlined a course to be given all medical schools on preventive pediatrics. While this has no doubt, been done along with didactic work a distinct course with training and observation in health centers, school inspection, milk stations, nutrition clinics, etc., will give a vision that the average young doctor heretofore has not experienced.

The proper mental attitude can best be produced in the doctor, be he pediatrician or general practitioner, by his actual participation. In one Southern state this has been accomplished by the formation of a state pediatric society, not a society limited to those whose practice is exclusively among children, but to all doctors interested in the practice of medicine among children. The purpose primarily was to interest all doctors in better pediatrics for the state. An annual dinner has encouraged social intercourse, a place on the State Medical Societies' program presided over by the officers of the pediatric society has added dignity and a prominence to the organization. Definite work has been outlined, and the executive officers of the society are termed the advisory committee to the state board of health in all child welfare matters. The society can be a great stimulus to the state department, and if properly organized can prevent or adjust any misunderstanding, should any arise between the doctor and the state.

Preventive pediatrics is here to stay. It is logical, constructive, and plans for the best interest of the nation. At present the national program is largely in the hands of lay organizations and the nursing profession. If this is the place for it, we should give them our moral and active support. On the other hand, if we should take the initiative in this important work, we must at once become active to reorganize and direct the various organizations so that efficient plans, free from friction, may be promulgated for the upbuilding of our future citizens.

DISCUSSION

Dr. J. Buren Sidbury, Wilmington, N. C.—I wish to emphasize most emphatically one point that Dr. Funkhouser has brought out, that is, that every state in the Southern Medical Association should have a state pediatric society which meets with the state medical society and have a part of the time allotted to the general session. This, in my opinion, will do more for the advancement of pediatrics in the South than any other one factor.

In regard to infant mortality I wish to use the term "congenital disease," probably for the want of a better term. We all know what we mean by congenital disease better than I can define it. When we are told that over 40% of all deaths during the first year of life are due to congenital disease; that over 75% of all deaths during the first month of life, and that over 90% of all deaths during the first ten days of life are caused by congenital disease we may get some idea of the tremendous toll that is going this way.

During the past ten years there has been a decline in the death rate from gastro-intestinal and respiratory diseases but the death rate from congenital diseases has remained constant and high.

In New York City in 1918 the death rate from these three conditions was as follows:

Respiratory deaths	2,993
Diarrheal deaths	2,032
Congenital Diseases deaths	5,344
Total deaths	12,657
Congenital Diseases	5,344
Respiratory and Diarrheal	5,025

More women of childbearing age die from conditions associated with pregnancy than from any other cause except tuberculosis. From these two conditions we can learn why our maternal as well as infant death rate is too high. This emphasizes most emphatically the importance of looking out for the baby before the baby is born, which at the same time will be looking out for the mother. In every community of any size there should be a prenatal clinic and a baby milk station in conjunction with a baby clinic. These new born babies should be turned over to a district nurse who in turn will register them at the baby clinic or baby health station and who will see to it that the baby is followed up for at least its first year.

Dr. J. Ross Snyder, Birmingham, Ala.—I think it is unfortunate that Dr. Funkhouser's paper came at this point in our program, because it will not get the discussion which it so richly deserves. I have observed the time, money and energy that have been expended by the various agencies with rather poor results so far as child-welfare is concerned. This is easily explainable, and I think Dr. Funkhouser has explained it. There has been no cooperation between these agencies. Instead of getting the results that should have been obtained, many have resulted in nothing at all. Some results have been harmful and some have even been vicious. Dr. Funkhouser has offered us some practical suggestions as to how results can be obtained. I heartily agree with the idea for the creation of a new department of health under a secretary or cabinet officer. At the same time I believe when that department is created our fight has just begun. We want to be sure that that department starts right, namely, that it shall center its interest on the oncoming generation.

Dr. Funkhouser (closing).—I regret very much that the time limit was placed on the discussion of this paper for the very reason that I was anxious to get the impressions of the health men and pediatricians as to our attitude in this work. The present plans seem to be so very chaotic that I feel it is incumbent upon the medical profession to step in and assist in organizing so that all departments or agencies can work together. At present they are working at cross purposes, it is necessary that they be combined. In their enthusiasm some have done things which we as physicians cannot approve. It is our duty to develop some plan and see that it is worked out for the best interests of all departments and for preventive pediatrics in the country.

ROENTGEN RAY DIAGNOSIS OF GASTRIC AND DUODENAL LESIONS*

By Leon J. Menville, M.D.,
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The diagnosis of gastric and duodenal lesions with the roentgen ray is an established fact and its accuracy has few parallels in medicine. The praise of such eminent surgeons as the Mayos, of Rochester, Sir Berkeley Moynihan, of Leeds, and many others for the roentgen ray in diagnosis of peptic ulcers is most gratifying.

Moynihan, in speaking of the diagnosis of gastric ulcer, says:

"Chief among the methods of investigation which can help us to a decision, I now place the examination of the stomach after the barium or bismuth meal by the x-ray. Indeed the radiographic examination alone is more accurate than all the other methods combined, and a diagnosis which is proved by subsequent operation to be correct in indicating the presence of the ulcer or demonstrating its size and position can be made in 90 per cent of cases. The radiographic method is the one certain method of diagnosis and is now an indispensable addition to the older and far less accurate procedures."

Carman, of the Mayo Clinic, who has an enviable record in the diagnosis of peptic ulcers and other gastric and duodenal lesions, presents the following statistics:

"From July, 1918, to January, 1919, there were at the Mayo Clinic 343 cases of peptic ulcer diagnosed by the roentgen ray. Of these 337, or 98.21 per cent, were confirmed by operation. There were 255 cases diagnosed as duodenal ulcer, of which 246, or 96.47 per cent, were confirmed at operation. There were 88 diagnosed as gastric ulcer and 84, or 95.45 per cent, confirmed by operation."

These findings show that the roentgen ray was correct in the diagnosis of peptic ulcer in 98.21 per cent, while in localization of the ulcer it was correct in more than 95 per cent, clearly indicating that the roentgenologic examination has an exactness which the clinical findings lack.

Prof. Karl Walko, of Prague, in an article on spasms of the digestive tract, has this to say of the roentgen ray:

*Read in Section on Roentgenology, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

"A roentgen examination is the best and simplest method to observe gastric motility. It visualizes the position, size, form and tonus of the stomach, shows the force and direction of peristalsis, the time of food retention in the stomach, indrawing, contraction, adhesions of the gastric walls; so that this method can no longer be dispensed with as a valuable adjunct for an accurate survey of the conditions and an exact diagnosis."

When a scientific instrument of precision such as the roentgen ray can make possible diagnosis in over 90 per cent of cases, it is something for us all to rejoice over. This does not mean that all who employ the ray for diagnostic purposes can do as well. Yet it is a mark, an ideal for us all to work up to. After several years of experience with the roentgen ray I am inclined to believe that the reason why most roentgenologists do not reach this high percentage of diagnosis is due to:

1. Lack of proper understanding of the anatomy, physiology and pathology of the stomach and duodenum. Without such knowledge one becomes only a technician and practically ceases to functionate as a doctor.

2. Improper technic.

3. Faulty medium used to test the motility of the stomach.

4. Insufficient illumination, eyes improperly prepared for screen examination.

5. Allowing the symptoms and history of the patient to influence the roentgenologist in the diagnosis.

The first essential, naturally, is a clear conception of the roentgen ray appearance of the normal stomach and duodenum. To acquire this knowledge one should see many hundred normal cases on the screen. As the normal stomach varies so greatly in size, position and tone, depending on the habitus of the individual, it is advisable for the beginner in this work to study the normal stomach under expert guidance. Once the normal is well understood, the abnormal becomes easier. This foundation becomes also the stone to the diagnostic arch.

A thorough study of gastrospasm is perhaps one of the most essential factors in the correct diagnosis of lesions of the stomach and duodenum.

"Organic deformity of the luminal contour is the principal roentgenologic sign of disease in the digestive tube. It is the mainstay of the roentgen diagnosis, not only evidencing a lesion, but directly revealing its seat, its extent, and often its character. Conspicuous examples of organic deformity are seen in the filling defects resulting from gastric cancer and the niche of chronic penetrating ulcer, the diagnostic value of which must be conceded."

In examining the stomach with the roentgen ray we often see visualized on the screen hour glass contractions, usually of two different types, the organic and the spasmodic, indistinguishable one from the other. The organic hour glass is most often associated with ulcer, but is also manifested in gastric lues and gastric carcinoma. These latter conditions show a somewhat different character. The characteristic of all forms of organic hour-glass stomachs is their persistence at every examination. It is not affected by antispasmodic to physiologic effect and is present at operation. Spasmodic hour-glass stomach is divided into two types: the intrinsic and the extrinsic. The intrinsic is always associated with lesions of the stomach, such as ulcer, cancer, syphilis and tuberculous lesions. This type of spasm is not found at operation and is not influenced by antispasmodics. The extrinsic type is not associated with lesions of the stomach, but is produced by pathological conditions outside of the stomach, such as duodenal ulcer, appendicitis, cholecystitis, etc., and some of the neurotic conditions. If it were not possible to differentiate these two types of spasm, the roentgenologist would be seriously handicapped, but fortunately for us we have in belladonna a most useful drug, if properly employed, to make the differentiation. Spasm of the extrinsic type produced by lesions outside of the stomach with the exception of those produced by duodenal ulcer are entirely relieved by belladonna to physiologic effect. As the latter condition is diagnosed in 96.47 per cent of cases, we should have but little trouble from this source. Of course, belladonna will not differentiate between organic and intrinsic spasmodic hour-glass stomach, but this is of no material importance, as both types are associated with gastric lesions. At operation we find only the organic hour-glass type, the spasmodic hour-glass being relieved by the narcosis.

The administration of belladonna to relieve spasm is best given in an institu-

tion, under the supervision of a trained nurse, and the roentgen examination should be made immediately after the patient is under the physiologic effect of the drug. It is seldom practical to make such an examination at the office and permit the patient to take the drug home, where it is often administered incorrectly. When the examination is made in the office, however, the patient must be in the office the next morning, several hours before the examination, when he is given the drug at frequent intervals, all the while being carefully observed until it has produced the desired effect, such as dilated pupils, flushed skin and dryness of the throat. This will not be done in a busy physician's office unless there is a trained nurse in attendance. Moreover, remembering that certain individuals have an idiosyncrasy for belladonna, we should be cautious into whose hands this potent drug is placed.

It is very important that the roentgenologist satisfy himself that the patient is well under the influence of the drug. He should not rely on the nurse or the patient for information. When we consider that a diagnosis based upon this procedure may either mean a serious operation or prevent a very necessary one, we should exercise every care in its administration.

It is well to mention that an hour-glass stomach that resists belladonna properly administered is usually sufficient evidence of a lesion of the stomach or duodenum, irrespective of a negative report at operation. If the surgeon is experienced and uses care, the lesion will be found and the diagnosis confirmed.

Many kinds of meals are used at present for testing motility of the stomach, some of which have a shorter emptying time than others. An ideal motor meal is the one used by Carman. It consists of a cooked cereal mixed with barium sulphate. Of this mixture each patient takes four ounces by weight with a small quantity of skimmed milk and cane sugar to taste. The patient is then instructed to abstain from further food and to return in six hours for examination. Buttermilk is perhaps more universally used as a motility meal than any other substance, and I find that it answers nearly every requirement for a correct motility test. An ideal meal would be one that is easily prepared, palatable and available to all. Our results would be more uniform, accurate and scientific.

METHOD EMPLOYED IN THE ROENTGEN RAY EXAMINATION OF THE STOMACH AND DUODENUM

There are several methods employed in America in the roentgen examination of the stomach and duodenum: the use of a specially arranged table making numbers of skiagraphs and seldom using the fluoroscope; the use of the fluoroscope alone; and the use of both the fluoroscope and the plate. The latter method to my mind is the ideal one, and is now being used by most of the roentgenologists in this country and Europe.

The combined method permits of checking one with the other. If a screen examination is negative, one or two plates will be sufficient. All suspicious lesions on the screen should be plated three or more times. To my mind a positive screen examination is worth more than any number of skiagraphs.

The patient with clothing removed down to the waist should first be examined in the upright position and then in horizontal position for a careful examination of the cardia.

In examining the stomach and duodenum by the fluoroscopic method it is essential to have a thorough relaxation of the abdominal walls. The neglect of this is probably the most frequent cause (outside of organic lesions) of failure to fill the duodenal cap. The most common cause of a tense abdominal wall is nervousness, caused by entering a room dimly lighted, and the noise of a humming motor. Add to this the fear of an operation following the findings of the roentgen ray examination and we can easily understand the mental inquietude of the patient and the tendency to nervous tension of the abdominal wall. It is advisable to have the patient seated in the examining room for at least five minutes or more to accustom him to the surroundings before proceeding with the examination. After this there is usually no further trouble. It is sometimes necessary to have the patient return at a later time for re-exami-

nation. The medium used in examining the stomach and duodenum is copied after Carman. It consists of 8 ounces of water, 3 ounces of barium sulphate, one teaspoonful of sodium bicarbonate, and raspberry juice to flavor. The bicarbonate of soda materially hastens the meal through the pylorus into the duodenum and in this way facilitates the examination. Schickes says:

"The speed of the gastric contents is controlled by the automism of the stomach and acid secretion in such a way that a larger quantity of HCl has a retarding effect."

The passage of the first mouthful of the barium mixture should always be carefully watched from the cardiac orifice to the lowest part of the stomach. This will often visualize small ulcers which otherwise might escape detection. The duodenal cap will often be found filled of its own accord, while in the same case some minutes later we find trouble in filling it.

The examiner's hands should be protected with gloves, either of leaded rubber or leather. The leaded rubber gloves are more protective than the leather. I prefer the leather gloves, as they are more flexible, less cumbersome, and I believe sufficiently protective. Most roentgen ray burns of the hand show quite distinctly a line of demarcation at the wrist, where the sleeves of a shirt or coat acted as a protective agency. Wearing gloves precludes a cold hand upon the abdomen and thus eliminates a certain tension of the abdominal wall.

The hand at first should be lightly placed upon the abdomen, using gentle force, as most patients are apprehensive of pain, then gradually increasing the force to an amount sufficient for the examination. Most examiners make the mistake of pushing up with their hand while attempting to express the contents of the stomach through the pylorus into the duodenum. This pushes the stomach away from the examiner's hand and adds to the difficulty of the examination. A better method is gently but firmly to grasp the abdominal wall corresponding with the antrum of the stomach with the tip of the second, third, fourth and fifth fingers of the examining hand, the palm of the same hand resting upon the abdominal wall, and then to pull the stomach down with the tips of the four fingers, the thumb of the hand being used to squeeze the contents as it reaches the pylorus through the pylorus into the duodenum. In this method sufficient force is employed not only to force the meal into the duodenum, but what is of the greatest importance, to balloon out the duodenal cap.

In examining the stomach for mobility and flexibility, the tips of the fingers are used. This is particularly important in certain types of carcinoma of the stomach, such as the early scirrhus carcinoma and early cases of linitis plastica where the filling defects are slight. The pressing in of the walls of the stomach as well as stroking it with the finger tips is of great aid in determining mobility and flexibility as well as the presence or absence of rugae.

The roentgenologist should not allow himself to be influenced by the symptoms given by the patient. Either the lesion is present or absent. Be sure of your position and then maintain it. Sir Berkeley Moynihan, speaking of gastric ulcer, states:

"Its diagnosis from the clinical evidence alone is difficult; its mimicry by other conditions is extremely frequent. I have spent a great deal of time in reading almost everything to which I could obtain access that has been written about gastric ulcer, and I am compelled to say that when the statements universally made are tested by the experience gained in the operation theater they are found to be inaccurate. My contention is that a full, clear and truthful description of the symptoms of gastric ulcer is rarely given, and that the conditions described as gastric ulcer are in the majority of cases indicative of other disease."

When in doubt it is always best to report the stomach and duodenum indeterminate. Conservatism is the guiding spirit of all skillful roentgenologists and we should religiously adhere to it. Nothing that I know will place the roentgen ray in disrepute more than a positive diagnosis in a doubtful case. The patient may go to operation only to be found negative by the surgeon who will in the future become doubtful of the value of the ray. None of us are infallible, and I urge you to be conservative. A negative report in a doubtful case is not as likely to lead to serious consequences as a positive report, because the patient will continue to mani-

fest symptoms and in time may be examined by a skilled roentgenologist who will either positive or negative the case. We must remember, however, that it takes a skilled surgeon to find some of the gastric and duodenal lesions, and it happens sometimes that a surgeon will fail to find at operation a lesion that actually exists. It would be of mutual advantage to the roentgenologist and the surgeon if the roentgenologist were present at operation, as he could in obscure cases help the surgeon by giving him the exact location of the lesion and the roentgenologist would be benefited by seeing for himself the pathology present.

A roentgen ray examination of the stomach and duodenum is usually only a part of a general examination, and a negative report in most instances only means negative for organic lesions and does not mean negative for functional conditions. The experienced roentgenologist has often observed cases that he had negatived for organic lesions whose symptoms were relieved or cured by a competent gastro-enterologist. There should be a close relationship between the roentgenologist and the gastro-enterologist. Frequent consultations would lead to a better understanding of cases and more respect for each other's ability.

Discussion follows paper of Dr. McKinney, page 615.

CANCER OF THE STOMACH*

By J. T. McKinney, M.D.,
Roanoke, Va.

Cancer of the stomach is one of the most frequent forms of cancer seen in the human body, more than one-third of the cancers in men and more than one-fifth of the cancers in women appearing in this organ. Statistics show that over 75 per cent of gastric cancers occur in the pyloric half of the stomach. As the cancerous growth involving the pyloric end is readily removable if an early diagnosis is made, the one great problem confronting us is the early detection of the cancerous growth. The rapid and early metastasis into the glands and neighboring organs makes an early diagnosis imperative, and it has been the failure to do this that has made the surgeon hesitate to operate, the immediate mortality being high and the great majority of these patients being poor risks. The increasing number of cases seen by the roentgenologist too far advanced for anything to be done for them has prompted the writing of this paper. Since in most instances the disease gives but few clinical diagnostic symptoms until far advanced, the one reliable diagnostic agent is radiography, and I know of no field in x-ray work where more can be accomplished. It is the medical man after all that we must depend upon, for without his co-operation we can never hope to get these cases in time to make an early diagnosis, nor get them to the surgeon in time to operate before extensive metastasis has occurred. Our duty, then, as roentgenologists is to call our medical confreres' attention to the great importance and value of a complete roentgen ray study of the gastro-intestinal tract in all cases in the cancerous age with vague digestive disturbances or clinical symptoms.

The roentgen ray findings in cancer of the stomach are more or less characteristic, though there are certain types of cancer which are difficult of detection, due in a large measure to their location. The double meal as used at the Mayo Clinic is the method employed in my work. The first meal consists of eight ounces of a well cooked cream of wheat and barium mixture given at 8:00 a. m., followed six hours later by a fourteen-ounce mixture of barium and buttermilk. It is hardly necessary to mention that all food should be withheld during the six-hour interval between the preliminary meal and the barium and buttermilk meal. Fluoroscopic examination of the chest and observation of the passage of the barium through the esophagus should never be overlooked by the roentgenologist.

The characteristic roentgen sign of gastric carcinoma is a filling defect. This defect, however, must be differentiated from spastic contractions of the stomach wall, pressure upon the stomach by extra-gastric tumors of the spleen, liver, pancreas, colon, omentum or from pressure of gas in the

*Read in Section on Roentgenology, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

colon. The irregular appearance frequently seen in the upper end of the cardiac portion from gas is easily differentiated by manipulation. The apparent filling defect caused by extra-gastric tumors are differentiated by watching the peristaltic waves. In the filling defect of gastric cancer there is an absence of peristalsis in the involved area. The pseudo filling defects due to spasm can usually be overcome by manipulation, although frequently the administration of belladonna or atropin becomes necessary to relax the spasm.

It is difficult to detect a small cancerous growth in the poorly filled atonic stomachs in flabby, weak, elderly people, with sluggish peristalsis. Perigastric adhesions will at times cause indentations that may be mistaken for cancer. The interference with the elasticity of the gastric wall, and an inability to cause an indentation in the gastric silhouette, is frequently noted in the involved cancerous area.

The filling defect due to cancer is permanent, frequently of an irregular, ragged or moth-eaten appearance, and remains in the same location and position. Tenderness may be noted in this region and occasionally anti-peristalsis.

The stomach shows a rapid emptying time in early cancer unless there is actual mechanical obstruction, due to narrowing of the lumen of the stomach. The gaping pylorus is due to infiltration of the muscular ring or absence of the pyloric closing reflex.

Pyloric obstruction on the other hand is seen to occur in about 60 per cent of gastric cancers and gives a six-hour residue. Since the great majority of observers and pathologists hold that most gastric cancers are engrafted on the site of an old gastric ulcer, the diagnosis and prompt surgical removal of the ulcer holds out one ray of hope in lowering the mortality of cancer of the stomach. The work at the Mayo Clinic, on the other hand, has shown that a duodenal ulcer very rarely, if ever, becomes the site of a carcinomatous growth.

The main points of differentiation between gastric ulcer and gastric cancer are that an ulcer projects from the gastric wall, while the cancerous growth, with the irregular, moth-eaten appearance extends into the gastric lumen. It has been found that most ulcers with a crater 3 cm. in diameter are carcinomatous.

Hour-glass stomach is occasionally seen in cancer of the stomach and is to be differentiated from the hour-glass due to gastric ulcer, gastric syphilis, spasm and perigastric bands of adhesions. Hour-glass due to ulcer is usually in the shape of a B. The ulcer being found in most instances on the lesser curvature, the constriction is at the expense of the greater curvature, with the contraction toward the lesser curvature. In carcinomatous organic hour-glass the isthmus is usually centrally placed and the contour of the canal irregular. In cancer there is rarely a six-hour retention in the upper loculus, even though the isthmus is quite narrow. Syphilitic organic hour-glass, however, without the clinical history and Wassermann reaction, is almost impossible of differentiation from gastric cancer by means of the roentgen ray alone. Spasmodic hour-glass may be due to disease of the gall-bladder, duodenal ulcer or the appendix, and may be erased by manipulation or caused to disappear with belladonna, with the one exception of hour-glass due to a duodenal ulcer, upon which belladonna has practically no effect.

The roentgen findings in gastric cancer are of the greatest help to the surgeon in aiding him to determine the advisability and possibility of operative procedure.

To quote Dr. William Mayo:

> "Should patients with advanced cancer of the stomach be subjected to radical operation? In view of the fact that some of these patients have lived beyond the five-year limit, we are compelled to answer the question in the affirmative. We should further consider the fact that the removal of the visible growth in the stomach, even if all the glands can not be removed, will give the patient a year or more of a very comfortable existence."

Where only the pylorus is shown to be involved, and free motility is present, if the general condition of the patient will permit, resection can be carried out with a fair degree of hope of prolonging the life of the patient. Tumors which extend well up into the pars media and show extensive involvement are rarely amenable for operative procedure. Involvement of the cardiac end of the stomach is an abso-

lute contraindication for operation.

The operation, after resection and excision of the tumor mass, is to apply the end of the stomach directly to the side of the jejunum about six to twelve inches from its origin.

DISCUSSION

Papers of Dr. Menville and Dr. McKinney.

Dr. Benjamin H. Orndoff, Chicago, Ill.—I might call attention to one point and that is the differentiation of that class of carcinoma that may or may not be operable. Some of the more recent work that we have been doing in connection with x-ray observation of the stomach has been the injection of oxygen into the peritoneum—the establishment of a pneumoperitoneum—and in that way we sometimes see evidence of adhesions. In some of the cases we saw the existence of adhesions to the anterior abdominal wall in such a manner as to convince us that the case was inoperable from the standpoint of removal of the entire carcinoma. Also the work in peritoneoscopy will show the extent of the cancer in the peritoneum or on the surface of the liver even when the filling defect in the stomach is apparently quite small. So it seems that in this direction we may get added diagnostic aid before a decision is reached as to whether the case is or is not operable.

I agree fully with one of the essayists who said that even though the entire malignancy was not removed, resection of portion of the stomach at times may prolong the life of the patient and possibly relieve him of considerable pain, as we have had a number of cases in which this has been done, and I am sure it was of considerable benefit to the patient, giving him an extended period of life.

Dr. A. L. Gray, Richmond, Va.—In discussing the question of technic, I think the medium used is immaterial provided we use a sufficiently fluid one to penetrate any crevices that there may be in the gastro-intestinal tract. I am very strongly inclined to think that if a technic is adopted by a reliable man, it is perhaps not wise to seek after strange gods and adopt the technic of another simply because some man in whom we have confidence uses something different. The sooner we adopt a standard meal, the more uniform and reliable will be our results. I doubt that we can employ a multiplicity of meals and come to any very reliable conclusions, certainly in regard to the functions of the stomach. I am inclined to think that the best thing for us to do is to adopt a meal that is convenient and one that we consider as standard and adhere to that.

Now in regard to the examination of the cardiac end of the stomach and the difficulty that most of us encounter in determining what is present and what is not present in that pole, I think it is absolutely necessary for us to examine the patient in the dorsal position. Many of us have been satisfied with the upright posture, attempting by pressure on the lower pole of the stomach to get the cardiac end full. We can do it sometimes, but I do not think we can uniformly do it. At least, it is my experience that we frequently can not fill the cardiac end of the stomach in a good big individual. However, if you place your patient in the dorsal position and turn that patient to the left side, the fluid meal gravitates to the cardiac end and fills it up almost without exception unless the cardiac end has some organic lesion.

Another matter that merits serious consideration is this: the general man, from his war experience, has learned the value of the x-ray. If he can not get a trained roentgenologist to do his work, he is going to get a technician, either a nurse or some other non-medical individual. Now, when some one reports that the x-ray examination fails to reveal this or that condition, the average practitioner of medicine or surgery does not say that John Smith failed to do it, but that the x-ray failed to find it. It depends entirely upon who is doing the work as to the reliability of the examination. We have got to watch carefully or else we are going to find roentgenology "knocked into a cocked hat" by the technician who jumps at the work just as he would at some trade in which he has served an apprenticeship for only a few weeks.

Dr. Vernon Blythe, Paducah, Ky.—X-ray studies of the gastro-intestinal tract are even in our medium size towns in a pioneer condition. I realize that in the city in which I live, a city of 30,000, only a year and a half ago there was practically no x-ray work done in the gastro-intestinal tract. Most of the work was confined particularly to fracture work and things with which we are mostly familiar and any one who had experience in x-ray work could make a diagnosis. I have found, coming out of the Army after two years' service in the x-ray department, that it has been a pretty uphill task to get a specific scientific conception of what the x-ray means in gastro-intestinal work. This, we know, is one of the most difficult forms of x-ray work. The average physician who installs an x-ray machine has had no experience in this sort of work, with the exception of a week or two in one of the large centers. Of course, any physician has a perfect right to do anything of that kind, but it should be our purpose in raising the standard of x-ray work to bring these things out among physicians.

I have also found a fear among lay people as to burns. I know there have been many burns.

I find it also very difficult in x-raying of the stomach to make a diagnosis on one plate alone. I do not think it is always possible to make a diagnosis upon a fluoroscopic examination and I often think it is necessary to make two or three plates. I know some men who in a questionable condition of ulceration are not willing to put their reputation on less than six plates and some even go to ten plates. It is very difficult to get people to recognize the fact that you have to have two or three plates. It is a question of loss of time and money with them. It is a question also of the physician who sends them telling them they have to go the limit to get a diagnosis. That is what we should all strive to get. It is important to go to the limit to get a diagnosis.

There are one or two little points on which I did not quite get the point of the essayists. One was the question that comes into our minds as to why there is a great delay sometimes in the emptying of the stomach. This is not always caused by cancer or ulcer, but lies farther down. I think often the delay is due to something in the cecal or appendiceal region or in the colon. There is no paper in our program on x-ray work of the lower intestinal tract. I think this is a most interesting phase of x-ray work. You find adhesions and various forms of pathology and they are shown by a sluggish action of the lower intestinal tract.

Dr. Clyde Donaldson, Kansas City, Mo.—The question came up as to the history of the patient. That question is a mooted one. It is a question whether we should take a history of our patients before examination. We are liable to be prejudiced by a typical history. I heard one roentgenologist say not long ago that he always makes his diagnosis before he makes the examination. I think that is a bad plan. I think the best way to do is to make your examination first and then get your history afterward. You may get an idea from observation which may or may not be supported by the history.

The Doctor did not dwell, very clearly at least, upon the part that the pancreas plays in these filling defects of the pyloric end of the stomach. I have had a couple of cases in the last two weeks in which I diagnosed lesions of the stomach—the pyloric end of the stomach—and which on operation both proved to be pancreatic lesions surrounding the stomach and giving a filling defect. I have also been recently disappointed in a case that I diagnosed some months ago, as duodenal ulcer and the case had a gastro-enterostomy done. I have always considered that as a cure of duodenal ulcer. It happened just before I left home that we re-examined the patient because of recurrence of the symptoms. We found evidences of an indurated ulcer of the duodenum with the gastro-enterostomy opening functionating; in fact, both portals of exit are functionating.

It has been my observation that in carcinoma of the stomach almost every case has a reverse peristalsis. I always consider that one of the true points. Another thing that we many times see proven is that a filling defect in the greater curvature is most often carcinomatous, while a filling defect of the lesser curvature, especially when small, is most often an ulcer.

Dr. H. E. Ashbury, Baltimore, Md.—A case which Dr. Menville showed, an early carcinoma of the pylorus, is certainly very good evidence that the x-ray as a routine method of studying gastro-intestinal diseases will detect early carcinoma.

I recall a patient who had an irregularity of the antrum close to the pylorus which I reported as early carcinoma. The patient had an achylia and was put on diluted hydrochloric acid pending operation. He felt so well that he refused operation. The doctor seemed to think there was an error. A year later the patient was operated upon and an inoperable carcinoma of the stomach was found.

The method which one uses I do not think should depend upon anything other than one's own feeling as to the best way for one individually to arrive at a conclusion. One may use fluoroscopy to determine the presence or absence of peristalsis. I get a much better conception fluoroscopically than on the plates. The persistence of defects, I think, can better be shown in serial plates, in which case you have a record that you lack even with a really good fluoroscopic impression. The manipulation of the stomach and intestines during fluoroscopy is a necessary aid in detecting adhesions. The differential diagnosis between gastric conditions in which we have an inhibition of peristalsis is a very interesting part of this study to me. We know that infiltrating lesions into the musculature of the stomach or intestines is bound to cause an inhibition of peristalsis either local or general. In this group of cases we have carcinoma, syphilis, linitis plastica and tuberculosis.

The roentgenologist should take a short history of his patient and make a physical examination of the part he is requested to examine. I have seen in the last year and a half a patient with syphilis of the stomach operated upon for carcinoma.

Dr. R. H. Pepper, Huntington, W. Va.—I do not quite agree with Dr. Donaldson that we should not take the clinical findings first. I think the x-ray should always either deny or confirm the clinical findings. I ask my clientele to give me all the clinical findings in the case before it is radiographed. I think the roentgenologist should be broad-minded enough not to let any preceding findings interfere with his diagnosis unless it is confirmed in the x-ray findings.

Dr. S. F. Casenburg, Knoxville, Tenn.—I wish to emphasize the importance of taking the history of the case first. I think it would give the patient the idea that we wanted to find out something that we did not find out by the x-ray examination if we take the history last. Take the history first. I do not think that we should be swayed by a previous history.

It would give us more data with which to work. The history is the first thing taken as a rule in any examination.

I should like Dr. Menville to tell us how many of these, or what per cent of the cases, showing a six-hour residue are supposed to be due to a chronic condition of the stomach without an organic lesion. I think a vast majority of the stomachs in which I find a six-hour residue do not prove to be either ulcer or cancer, but are simply due to an atonic condition of the stomach.

Dr. J. W. Scott, Lexington, Ky.—I believe we might look at this discussion of the history and x-ray findings in this way. You expect the internist to get the history and make the physical examination and to draw more or less definite conclusions from his findings. One would think it strange in an internist to send a patient to the roentgenologist without having taken a history or made an examination. So it seems to me that we are putting the cart before the horse by using methods that the internist is supposed to use. It seems to me the roentgenologist should use his own method first and then check up with such other findings as are obtainable.

Dr. O. H. McCandless, Kansas City, Mo.—We are very fond of showing plates that are conclusive in their findings. There is one thing that we find rather conspicuous by its absence, the broad fat man who comes in with the little shoe-button cap. We do not see many of those plates on exhibition. This type has interested us a great deal. These patients may show that they had an exsanguinating hemorrhage and that clinically they are ulcer cases. There is a history of the patient's having suffered some gastro-intestinal hemorrhage. This is the type of patient in whom we have great difficulty in visualizing the cap. These are the moot problems we have to deal with. These are the cases where the internists expect us to show more interest. In these cases we have great difficulty in showing anything on the plate. The advantage of a study of the plates over the fluoroscope, it seems to me, does not need to be discussed. The first thing that is done on our own place is that a plate is made of the abdomen before other examination.

Often within a period of a few days we find several patients showing renal calculi who had been sent in for an examination of the gastro-intestinal tract. At our last x-ray club meeting in Kansas City, one of the men turned around to Dr. Donaldson and told him about a patient he had recently x-rayed who had a stone in the kidney. The patient had been sent in for gastro-intestinal tract investigation and gastro-intestinal findings had been made and reported. The stone was overlooked in the report because of failure to make preliminary plates.

After a large opaque meal in gastro-intestinal work we have trouble in checking up suspected renal stones until catharsis. A little residue in the gastro-intestinal tract may delay our findings. Often there is delay while waiting for the patient to be cleaned out. A fermentation that can be shown under the screen can not be shown on plates. The gaping pylorus of a beginning gastric crisis can not be shown on the plate. The meal travels rapidly through the pylorus in these patients. Two things suggest themselves: one is the gaping of the pylorus from spinal syphilis and the other is the problem of gaping pylorus from malignancy or some growth or influence that makes the ring unable to close mechanically. The differentiation between these conditions depends upon the history, the Wassermann, etc. One of the first things you want to know when a patient is presented to you in the fluoroscopic room is how many seconds it takes the pylorus to open and close. The plate does not give you such data. If the pylorus opens and closes within 15 seconds you feel very comfortable with regard to acute local irritation. We had one case in which a second duodenal cap was shown at the ampula of Vater in which the rate was 40 seconds, while the true cap had a cycle rate of 5 seconds. The supernumerary cap worked like an old-fashioned syringe, squirting material into the duodénum.

When a patient comes into the office with a history of hematemesis the doctor who refers the patient expects you to find a great amount of gastro-intestinal disturbance. A few weeks ago we had our third case of hemorrhage resulting fatally. We ran over to the City Hospital to perform an autopsy in a case in which a diagnosis of ulcer had been made. The man died within twenty-four hours after a hemorrhage had occurred. Upon removal of the stomach, which included the esophagus, and taking out of the duodenum below the duodenal cap, an examination of the esophagus elicited nothing. We proceeded to open the stomach and examination showed nothing except a slight hemorrhagic appearance. I asked the boys to wash out the stomach. Upon transillumination with an electric bulb we found a submucous hemorrhage about the size of the palm of your hand; no ulcer could be demonstrated. Then we opened up the chest and the mediastinum and found varicosities 4, 5 or 6 mm. in diameter. These varicosities give us a great deal of trouble. When one has to stand on his findings that the patient is negative for gastro-intestinal defect one has to be very certain because the man who referred the case may insist that something has been overlooked.

Dr. Menville (closing).—The question of the percentage of six-hour retention in normal cases is a difficult one to answer, as so many factors are to be considered. A six-hour retention depends upon the type of motor meal one uses. Some use malted milk, some buttermilk, and others cereals, all having different emptying times. Severe headaches may retard motility. Often a patient, after taking the motor meal, lies down and rests until time for the examination. This will also retard motility. The eating of food between the time of taking the motor meal and the examination would give the impression of a retention. The above factors would only produce a slight retention and might be disregarded. When the retention is moderate, no matter what motor meal you use, look for pathology and if you do not find it, then change your motor meal.

As to the question of technic, personally I am always ready to listen with attention to the way

in which my confreres make their examinations, and, if thought worthy, I make use of them. Some of us have reached such a high degree of perfection in our art that nothing is new. This is of course a mistake. My contention is that most men in examining a stomach push the stomach up with their hands rather than pull it down, making the filling of the duodenal cap much easier. This was mentioned with the idea that there might be gathered here some who were not so well versed in this work.

A point was raised that the history should be taken after the examination. To this I do not agree, as we would perhaps be influenced in our diagnosis. The history is a most important part of an examination and should generally be left to the physician to interpret, and we should only report what we see.

The slides were chosen to illustrate the various lesions of the stomach and among them were some rare conditions which were kindly lent me for the benefit of those who had not had the opportunity of seeing them before.

Dr. McKinney (closing).—I think we ought as roentgenologists never lose sight of the fact that first and foremost we are physicians; and in the words of the great English surgeon, Sir Berkeley Moynihan, "I am a physician practicing surgery," we should ever keep before us the thought "I am a physician practicing roentgenology." As to whether a careful history made before or after examination is going to help the roentgenologist in making his diagnosis is a thing each individual worker must decide for himself. I certainly think no examination of the gastro-intestinal tract any more than an examination of the chest is complete without a careful clinical history. Certain shadows in the chest mean certain things to a roentgenologist if he knows the history of the case. The history in a number of instances enables us to lay especial stress upon a certain portion of the gastro-intestinal tract and I think, as was brought out by one or two of the other men, the roentgenologist should be dictated to by no one in doing his work but should take the number of plates that he thinks necessary regardless of whether the referring physician wants one or two. A second examination should always be made in doubtful cases, and we should never hesitate to have the patient return for re-examination when necessary.

I agree with Dr. Orndoff that the pneumo-peritoneal work is advisable in some gastro-intestinal lesions. This would be very valuable in some of the borderline lesions where you may be in doubt.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

THE KONDOLEON OPERATION FOR ELEPHANTIASIS: A REPORT OF END RESULTS*

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On two previous occasions I have reported cases of elephantiasis in which the Kondoleon operation was performed. In this paper I wish to discuss the late results which have been obtained in these cases, and to mention certain factors which seem important in the treatment of elephantiasis.

Elephantiasis results from an hypertrophy of the connective tissue elements of the skin, subcutaneous tissues, and deep aponeurosis. The condition usually develops in patients who have an obstruction to either the lymphatic or the venous circulation draining the affected area. Such obstructions may occur from a surgical removal of the lymph glands draining the area, from adenitis, or from obliterative thrombophlebitis or lymphangitis, and usually produce edema in the tissues through inability of the vessels properly to drain the lymph. Stagnation of lymph in tissues predisposes the tissues to infection by micro-organisms, usually some type of streptococcus, and after such an infection an obliterative lymphangitis and an hypertrophy of the connective tissue elements usually result. As these changes progress the picture gradually changes from that of a simple lymphedema to one of elephantiasis. In the latter condition the pathologic picture is one of tremendous thickening of the dermis, of the connective tissue trabeculae lying between the dermis and the aponeurosis, and of the deep aponeurosis. The epithelial layer of the skin is thinned out through the stretching of the skin brought about by the accumulation of lymph in the tissues beneath it, and the elastic fibers of the skin are found to have disappeared. The lymph channels which have not been destroyed are markedly dilated and extravasated lymph is found in the subcutaneous fat. Areas of round-cell infiltration are scattered throughout the hypertrophied connective tissue. The disease is usually chronic with a tendency to grow progressively worse. If in the beginning the limb could be kept from swelling by the use of firmly applied bandages it seems likely that the progress of the disease could be controlled, but, as a rule, at this stage of the disease great efforts to control the swelling are not made, and as the limb increases in size and the extravasation of lymph becomes greater it becomes more difficult for the remaining lymphatic vessels to drain the tissues on account of the pressure made on them by the extravasated lymph. Many patients, if the condition is allowed to progress, eventually develop erysipelas in the edematous tissues. Following such attacks the swelling in the limb usually rapidly increases and as time passes the attacks of erysipelas become more and more frequent, the limb finally becoming tremendously enlarged and deformed as a result of the edema and the thickening of the skin.

In some instances it is impossible to obtain from the patients a clew which throws light on the etiology of the disease in that particular case. While filariasis, on account of our earlier teachings, is often thought of in connection with elephantiasis the majority of patients in this country in whom the disease is seen are found to be free from filarial infection. In tropical countries, however, many of the patients who develop elephantiasis are found to have an associated filariasis. The latter disease produces a lymphatic obstruction and the elephantiasis develops after a streptococcic infection has occurred in the

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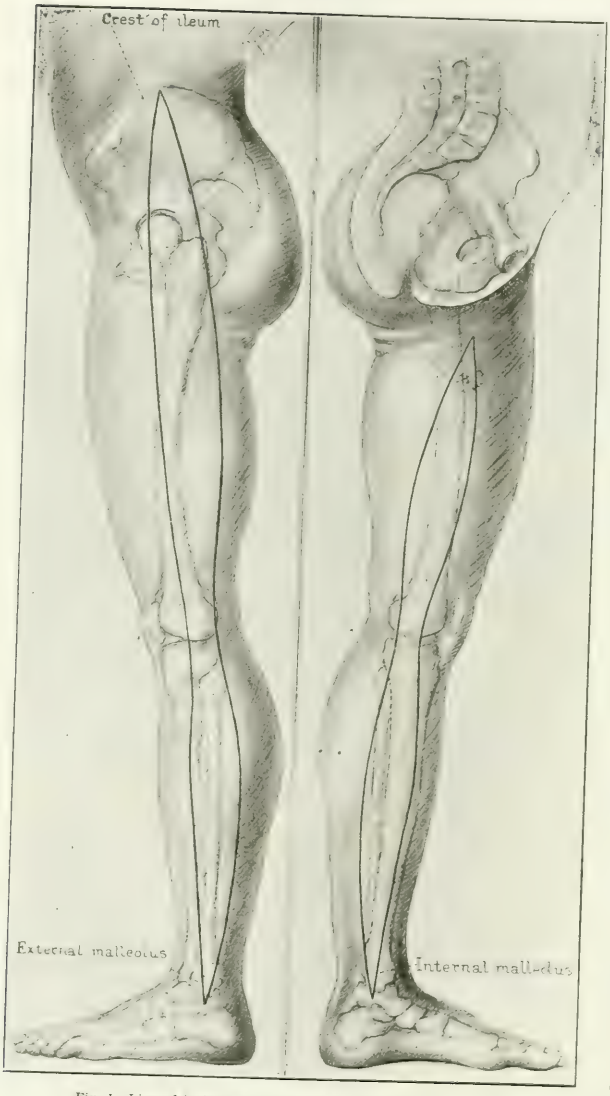

Fig. 1 Line of incision on outer and inner surfaces of the leg.

tissues, secondary to the obstruction. Certain writers have called attention to the fact that true elephantiasis may occur independent of lymphatic or venous obstruction and solely as a result of repeated attacks of streptococcic infection. In several patients in the group operated upon in the Mayo Clinic the condition seems certainly to have developed in this manner. It seems likely also that the condition may develop through the blood stream during the presence of a streptococcic infection in another portion of the body. As a verification of this statement one of our patients developed a typical elephantiasis in all four extremities following an infected vaccination wound on the left arm. It is difficult to explain the development of the condition in certain persons except on such a basis. Every case of acquired elephantiasis which we have seen has been preceded by lymphedema which in many instances was secondary to a mechanical blockage of the lymphatic or venous systems and in others apparently to a direct bacterial invasion of the tissues.

For many years the surgical treatment of elephantiasis was unsatisfactory. In 1912

Kondoleon suggested an operation based on his own ideas and on ideas previously advanced by Lanz, von Oppel and Rosanow, in which the condition was treated by the removal of a large amount of the skin, subcutaneous fat, and deep aponeurosis from each side of the affected limb. The aponeurosis covering the muscles seems definitely to separate the deep and superficial lymphatic systems and the Kondoleon operation was performed with an idea of uniting these two circulations by a wide removal of the aponeurosis and thus allowing the deep circulation which is not affected by the disease to drain the stagnated lymph from the obstructed superficial circulation. Such an operation allows the skin and a small amount of the subcutaneous fat to drop down on and become adherent to the muscles and in this way new lymphatic vessels are probably established. Following an operation of this type in which a sufficient amount of skin, subcutanteous fat, and aponeurosis has been removed, the limb is much diminished in size. It probably requires considerable time for new lymphatic vessels to form, and it is necessary for patients firmly to bandage the limb for an indefinite period after operation in order to prevent edema in the tissues. In our experience it has usually been comparatively easy to control the swelling of the limb following operation, although usually it was impossible before the operation. It also seems probable that prevention of stasis of lymph in the limb after operation is of great value in ridding the tissues of the streptococcic infection which already exists.

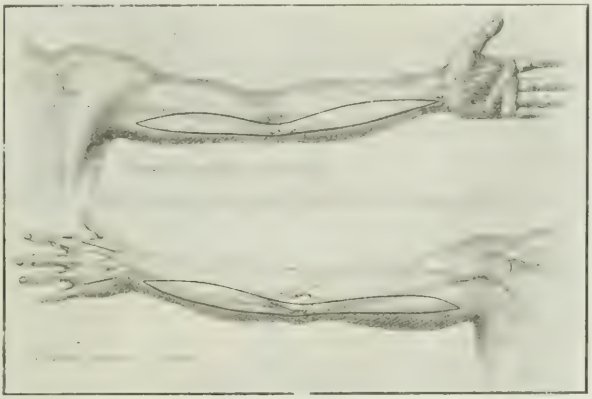

Fig. 2.—Incisions on inner and outer surfaces of the forearm.

TECHNIC OF OPERATION

The operation is best performed as follows: a long, modified elliptic incision, which includes the skin to be sacrificed, is made on one side of the affected limb. On the outer aspect of one of the lower extremities this incision extends from the crest of the ilium to a point a little below the external malleolus of the fibula (Figs. 1 and 2). Then, in order to facilitate a wide removal of the subcutaneous fat, the skin is reflected on each side of the incision for a distance of about 1½ inches. The skin is retracted and underneath each of the edges of reflected skin a long incision is made through the edematous subcutaneous fat down to and including the aponeurosis. These incisions are made almost parallel with the original skin incision (Fig. 3). Included between them is a quadrilateral piece of edematous fat and aponeurosis. At their upper ends these two incisions through the aponeurosis are connected by a transverse incision. The tissues to be removed are now free except for the attachment of the aponeurosis to the underlying muscle. By traction on the tissues to be removed it is easy to dissect the aponeurosis from the muscle throughout the length of the entire limb and to remove in one long piece the skin. edematous fat, and aponeurosis (Fig. 4). A number of vessels which tend to bleed profusely are encountered. These are controlled temporarily with forceps. After the tissues have been removed these forceps are taken off, and surprisingly few

of the vessels will be found to need ligatures. The wound is closed with interrupted silk-worm gut sutures without drainage. It is usually necessary to do a similar operation on the opposite side of the limb. The incision for this second operation should extend from the extreme upper portion of the inner surface of the thigh down to a point a little below the internal malleolus of the tibia. In the earlier cases we often performed the operation on both sides of the limb at one operation, but we have largely abandoned this procedure because in several patients rather severe shock followed the operation.

Matas was first to perform the Kondoleon operation in this country and reported cases in which he and Gessner had operated in 1913. Royster, in 1914, and Hill, in 1915, also reported cases in which operation was performed by this method. We first performed the operation in January, 1917; we have now operated in thirty-one cases of elephantiasis and in two cases of lymphedema.

In the earlier cases very little preoperative treatment was given, but later we learned that rest in bed with elevation and firm bandaging of the limb over a period of two or three weeks simplified the operation. Following such a procedure the limb usually diminishes considerably in size, and it is much easier to estimate the amount of skin which should be removed and still allow a satisfactory closure of the skin edges. It also seems that following such treatment the blood vessels supplying the diseased tissues decrease markedly in size, and this, too, adds to the ease with which the operation may be performed. In order to prevent the development of shock, a hypodermic of 1/6 gr. of morphin is administered one-half hour before the operation; this is repeated as soon as the patient has thoroughly awakened from the anesthetic. After the operation the patient is kept in bed for from ten days to two weeks, and the limb is kept elevated and firmly bandaged. As soon as the tenderness in the limb has subsided an elastic bandage is applied which is worn for an indefinite period when the patient is up and about.

The results which we have obtained through this operation have been as a whole very satisfactory. In nearly all instances the limb has diminished considerably in size and by the use of bandages the patient has had very little difficulty in preventing swelling. Patients who were having recurring attacks of erysipelas before operation have had no recur-

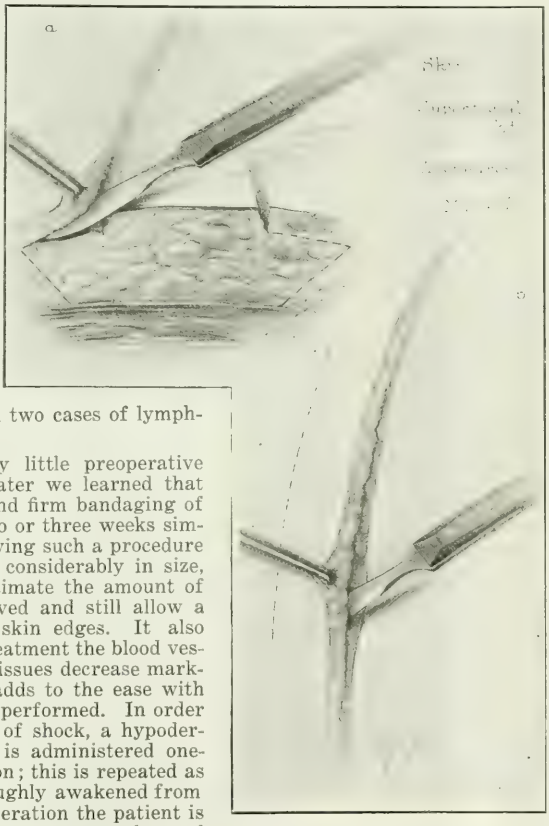

Fig. 3.—a. Method used to facilitate the removal of a large amount of subcutaneous fat. After the incision has been made the skin and a layer of fat are reflected in order that a larger mass of fat may be removed. b. Cross-section view of the same method.

rence of these attacks; in other words, in practically all cases the progress of the disease has been definitely controlled by the operation. It does not seem reasonable to expect an operation of any sort to restore a limb affected with elephantiasis to a perfectly normal state, although in a number of instances the limb, by the subsequent use of bandages, has remained about the size it normally should be and the thickened skin has become soft and much nearer normal in appearance. The majority of patients have been well satisfied with the result and very grateful. A few have been disappointed, although in some of these cases the limb has been considerably diminished in size by the operation and further swelling has been prevented through the use of bandages. It is our custom carefully to explain to patients that the operation is to be done with the idea of controlling a disease which tends slowly to grow progressively worse and that it will be necessary for the limb to be bandaged following operation. Such an understanding before the operation does much toward satisfying the patient as far as the result is concerned. In two instances we have found it necessary to reoperate in order to remove certain areas of hypertrophied skin which remained following the operation and, in order to obtain the best results, I believe that this second operation is almost necessary in some of the cases with extensive enlargement.

Since we began to use the Kondoleon operation we have seen a number of patients with lymphedema which in some instances was difficult to distinguish from an early elephantiasis. We have advised many of these to continue the use of bandages in the hope that the further progress of the disease could be checked, and advised operation only in the event of its being impossible to control the swelling by such means. The swelling in the majority of enlarged limbs due to simple lymphedema can be controlled satisfactorily in this manner. It is necessary when contemplating operation to distinguish lymphedema and elephantiasis from the deformity which sometimes occurs through excessive deposits of adipose tissue and from the swelling without edema which is often seen in patients following thrombophlebitis.

Of the thirty-three patients operated upon two were operated upon for definite lymphedema; the result in both was satisfactory. In one patient the elephantiasis was of the congenital type, the swelling in the limb having been present from birth. While we have been unable to examine this patient since operation, letters from her claim that very little improvement has taken place. Two of the patients probably had developed the condition from

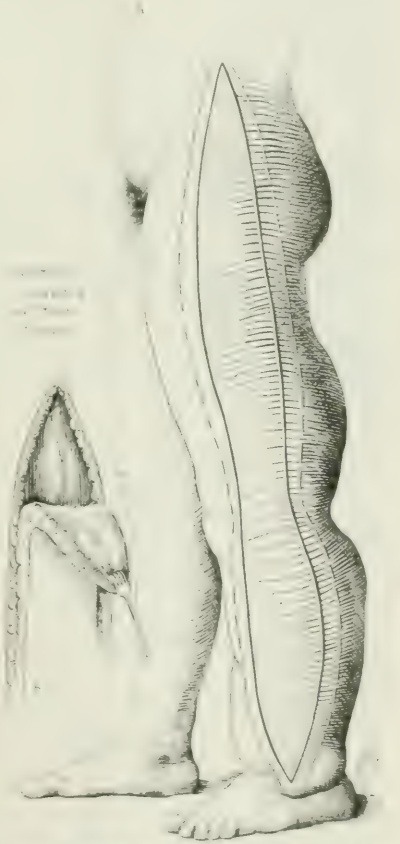

Fig. 1. a. Incision [illegible] Dotted lines a and b show extent to which the skin is reflected for the removal of subcutaneous fat. b. Skin, a large amount of subcutaneous fat and aponeurosis removed in one piece.

an associated tuberculous adenitis or lymphangitis; in both of these a satisfactory result was obtained. In four patients the elephantiasis had apparently developed secondary to a phlebitis which had followed a slight injury; in two of these the results have been satisfactory and the other two write that they are not satisfied with the result. In nine patients the elephantiasis apparently developed secondary to infection in various types of wounds in previously healthy persons, two following infection in operative wounds. In all of these patients the disease was only moderate in its extent and the results were satisfactory in all. In fifteen patients the etiology was unknown, the disease having developed spontaneously as far as could be ascertained from the patients' histories; two of the patients gave a history of having had irregular menstruation prior to the onset of the disease. Most of the patients who had been subject to recurring attacks of erysipelas and those with the greatest swellings and deformities were in this group. All these patients were much improved by operation; two patients were operated upon the second time, and it is possible that better results could be obtained by a second operation in several others of the group.

SUMMARY

1. In the Kondoleon operation we have a measure which seems definitely to control the progress of elephantiasis.

2. The best results are obtained in patients treated by two or three weeks' rest in bed with elevation and firm bandaging of the limb preliminary to operation.

3. When operating it is necessary to bear in mind the fact that a large amount of skin, subcutaneous fat, and aponeurosis must be removed in order to obtain the best result.

4. When patients are up and about it is necessary to bandage the limb for an indefinite period, and oftentimes permanently, following the operation.

5. Before operation there should be a definite understanding between the surgeon and the patient with regard to the fact that the operation is to be done for the purpose of controlling a disease which if left alone usually grows progressively worse; that a perfectly normal limb is not to be expected as a result of the operation, and that it will be necessary for bandages to be worn following the operation.

6. Second operations in which portions of hypertrophied skin are removed may be performed upon patients in whom considerable deformity still remains after the first operation, with expectation of further improvement.

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DISCUSSION

Dr. Lloyd Noland, Birmingham, Ala.—Nearly seventeen years ago I went to Panama, where I served first as assistant to Dr. A. B. Herrick in the Ancon Surgical Clinic, and later as Chief of Clinic at the Colon Hospital. Many cases of elephantiasis, not less than one hundred, I am sure, presented themselves to us for treatment in the first few years of our work there, and since seeing Dr. Sistrunk's results, I must confess that I am ashamed of the results we secured on the Isthmus. I can still hardly realize that the wonderful lot of cases collected by Dr. Sistrunk could have occurred outside the filarial countries. I understand from Dr. Sistrunk that none of these cases is of the filarial type, and I think that some differentiation should be made between the mechanical type shown here and the true falarial variety. In the filarial type bilateral involvement of extremities is extremely rare, and I think that there is very much more thickening of the skin than in other types of elephantiasis. It is also more common to find scrotal and labial involvement in the filarial variety. We saw a number of scrotal cases, some of them showing enormous enlargement, and I well remember one patient who had constructed an ingenious wheelbarrow arrangement in which he supported his scrotum.

Plastic surgery in the scrotal cases, while difficult, gave us very good results, but our work on extremities was never satisfactory. We attempted in a number of instances the removal of wide strips of skin and cellular tissue down to

the aponeurosis, but we did not attempt removal of the aponeurosis, and apparently this accounts largely for our poor results.

As I sat here and listened to Dr. Sistrunk I deeply regretted that the Kondoleon operation had not been discovered at that time. I wish to congratulate Dr. Sistrunk on presenting results that I would have considered impossible up to this time.

Dr. A. B. Rocks, Gadsden, Ala.—I wish to report a case which came under my observation three or four years ago and the photograph of which I presented to Dr. Sistrunk some years ago. The patient was a monstrosity in childhood and at the age of twelve weighed 240 pounds. After that we had not the facilities for weighing her, so she was sent to the coal yard to be weighed, and rached a weight of 425 pounds. Her elephantiasis followed an infection of the left foot eight years previously. I had seen some of Dr. Sistrunk's work previous to this time and operated upon this young woman. She had a quick and uneventful recovery, but ten weeks after the operation she died very suddenly of apoplexy. At the time of operation the leg at the knee was thirty-four inches in circumference and the entire left leg was involved. This case, in the beginning, was a plain case of lymphedema, as brought out by Dr. Sistrunk.

I should like to ask if Dr. Sistrunk sees elephantiasis in the arms following breast amputation; if these patients sometimes have a lymphedema which terminates in elephantiasis?

Dr. Samuel Orr Black, Spartanburg, S. C.—In the fall of 1917 it was my privilege to be associated with Dr. Sistrunk as his assistant and at that time he was doing the operation in a manner somewhat different from that described today by him. Just what constitutes the real, true Kondoleon operation I do not know, but at that time he was making the skin incision practically the same as just shown on the board, down to the aponeurosis. The aponeurosis was divided throughout the length of the involved area and the edges were freed by dissection, retracted, and tacked to the muscles beneath with a few interrupted catgut stitches. This left exposed a considerable surface of muscle. The operation described here today, where he excised a portion of the aponeurosis with the overlying fat, should really be called Sistrunk's modification of the Kondoleon operation and by means of it he should get better results than by the old technic.

We used to suspect, while doing these cases, that they might be somewhat predisposed to pulmonary fat embolism, but I do not remember a case in which this ocurred clinically while I was with him. I should like to ask whether any has occurred since then.

Dr. Sistrunk (closing).—With regard to the lymphedema seen following breast amputations, I had hoped that this would prove to be an operation which would help such patients, but in spite of all my efforts to pick out cases in which I thought the operation would be beneficial, I have not found any. The ordinary lymphedema following breast amputations is controlled very well by bandages, and I have not seen any cases in which I thought the edema bad enough to warrant the operation except in patients in the late stages of the disease. For that reason I did not advise operation in those cases. Our experience with the lymphedema following breast amputation is, as a rule, that when the arm is well bandaged and massaged the edema will disappear after two or three months. The patients who develop very marked edemas usually have a recurrence in the axilla.

In regard to Dr. Black's description of the operation, I must say that we have changed this since he worked in Rochester and now do an operation which is easier to perform and which gives better results. We have as yet had no cases in which pulmonary embolism developed.

HERNIA: TRAUMATIC AND STRANGULATED*

By Samuel Orr Black, M.D.,
Spartanburg, S. C.

A hernia is a protusion from the abdominal cavity of peritoneum liable to contain, containing at times, or permanently containing, any viscus or part of a viscus (Da Costa).

In every 1,000 people it is estimated that 44 per cent will have hernia. There are three hernias in the male to one in the female.

In 347 operative cases in my hospital experience in 12 consecutive months during the year 1917-18, 288 were in the male sex and 59 were in the female. This number, however, included 29 post-operative cases and hence should be deducted from the sum total, in order to attain a more correct ratio in this particular series. Of the 347, 274 were inguinal and of this variety there were 257 in the male and but 17 in the female. Twenty-three were femoral in origin and of these 13 were in the male and 10 in the female. The remaining 21 were umbilical hernias, of which 8 were in the male and 13 in the female. During the past few months we have operated upon 31 hernias in the Spartanburg Hospital, of which 24 were in the male and 7 in the female.

Hernia is of common occurrence. Increased intra-abdominal pressure is unquestionably a predisposing cause, espe-

*Read before the Southern States Association of Railway Surgeons, Auxiliary of the Southern Medical Association, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

cially in children. Straining at stool or during micturition, lifting or carrying a heavy weight, prolonged vomiting or coughing, debilitating illnesses, all predispose by increasing pressure at one or more points on the abdominal wall. It is, of course, unreasonable to presume that these acts would make the pressure greater at one point than at another, yet if there be a weakened spot, from some failure in development, this spot will be the first to give away.

The majority of hernias are unquestionably the result of a deficiency in development of the abdominal parietes. This deficiency may be aggravated from time to time as the individual ages or grows in stature, by either of the above enumerated predisposing causes.

A hernia consists of its coverings, sac and contents. The coverings depend upon the location of the hernia and the sac is of peritoneum. Once a sac has formed it is almost certain to persist because its exterior adheres to the surrounding structures. The sac thus becomes irreducible in practically every instance. The contents vary, though usually it is a portion of the small bowel. It may be, however, stomach, cecum, ascending colon, bladder, ovary, or what not.

One may fairly well judge the contents of a hernial sac by bearing in mind the following points: if on percussion one elicits tympany and finds by palpation a smooth elastic tumor, an impulse upon coughing and hears a gurgling sound when the tumor is reduced, by taxis, one may be reasonably certain that bowel was in the sac.

If the mass be firm, lobulated, dull on percussion, with only a faint impulse on coughing, and no gurgling upon reduction, we should suspect omentum first, and some more or less solid viscus next.

If the tumor be soft, smooth and elastic at one place and firm, nodular or lobulated at another, with an area of tympany here and one of dullness there, we may deduct the presence of both bowel and omentum.

Pathologically, hernias are spoken of as reducible, irreducible, incarcerated, strangulated or inflamed. Anatomically they are termed inguinal, femoral, obturator, ischiatic, diaphragmatic, epigastric, umbilical, vaginal, lumbar, etc. Clinically, one may speak of a hernia as being congenital, acquired, or traumatic.

In children hernia is very common. Inguinal, umbilical and femoral are the ones most frequently found in the order named. Malgaigne has estimated that

> "During the first year one out of every 21 children has hernia and that this proportion is maintained until the age of six. At the age of 13 there is 1 rupture in every 77 children, and Ochsner insists that fully 95% of all ruptures in children may be cured without operation."

Strangulation in children is rare. (DaCosta.) A rupture may be present in a child today and not show again for a week or longer.

Recently we saw a case of strangulated inguinal hernia in a child of 2 years. Every attempt at reduction failed. A small dose of morphin was administered. The child went to sleep and the hernia promptly reduced itself.

Hernia sysmptoms depend upon the location of the hernia anatomically, and the type of hernia, pathologically.

This paper has to do especially with traumatic and strangulated hernia.

Traumatic hernia is so rare as to constitute a surgical curiosity, yet it does occur. It is characterized by great pain, collapse, nausea, and vomiting. The patient is unable to stand or to walk. There is a distinct mass, exquisitely tender, which does not disappear upon recumbency which may yet be reduced by taxis or by operation.

In more recent years the Workman's Compensation Act has attracted considerable interest in traumatic hernia. Patterson observes that there is a strong feeling among employers of labor that they are bearing the cost of a congenital defect in certain of their employees. He proposes an amendment to the law which would assure compensation only to those who suffered a real injury sufficient in intensity to produce the above enumerated symptoms. All other cases would be considered congenital or of slow development and not compensable, being considered a disease and not an accidental injury.

This mode of reasoning is in keeping with that of Wm. B. Coley, who in analyzing over 75,000 cases of rupture insists that

"Hernia in the vast majority of cases is a disease rather than an accident. It is due to a congenital defect and this defect is the main cause of hernia while the exciting cause plays a minor role."

In our recent series of 31 cases in the Spartanburg Hospital 9 were of the strangulated type. Seven of these were in the male, and 2 were in the female. Of the sum total of the strangulated ones, 6 were inguinind and 3 were femoral.

The symptoms of a strangulated hernia depend upon the location and type of hernia. If an entire loop of bowel is strangulated the pain is more severe, the obstruction is more complete, spasmodic colic occurs with increasing frequency and severity. Nausea and vomiting follow in rapid sequence and if unrelieved, collapse and then exhaustion soon ends the patient's agony.

If on the other hand, however, but a portion of the lumen of the bowel be strangulated, and the continuity of the bowel lumen is not seriously interfered with, the symptoms are milder in onset, longer in character; until perhaps the bowel ruptures, at which time general peritonitis sets in. This constitutes the so-called Richter's hernia and was described by Richter, in 1778. He was a contemporary of Percival Pott, John Hunter, Benjamin Rush and was but a few years in advance of the immortal John Abernathy.

In our series of strangulated cases herein reported 5 were of the Richter type. All gave rise to a "mass" or swelling, to pain, usually constant but with spasmodic paroxyms of exquisite violence, to accelerated pulse, to a decided leukocytosis and to a mild febrile state.

Each case was successfully operated upon. Four were inguinal and one was femoral. In five cases the bowel was so dark in color that it was deemed advisable to risk its return to the abdomen safe, only provided a drainage tube was inserted through an adjacent stab wound. This we did in each case and they made a complete recovery. With this drainage tube as a safety gage many strangulated hernias may be safely restored to the abdomen without bowel resection, which is a grave procedure in all strangulated hernias of over 12 hours duration.

In strangulated cases where there is some doubt as to whether or not the strangulated bowel will eventually perforate, it is safer and saner to reduce the bowel and institute drainage than it is to leave it on the abdominal wall or to do a resection. This is particularly true because the intra-abdominal warmth and moisture is superior to artificial procedures, and furthermore the strain or traction on the mesentric vessels is far less. This in itself secures a richer and greater blood supply to the involved area, thus hastening recovery.

In cases of strangulation, however, where it is reasonably certain that the bowel is going to perforate, unless the patient be in exceptionally good physical condition, sufficient to stand a resection, it is better to leave the involved area wrapped thoroughly in vaselinized gauze on the abdominal wall where hot applications can be applied regularly. In one case operated upon by ourselves in another hospital the bowel was left for five days on the abdominal wall before it finally regained its color, tone and health, at which time it was dropped back, the abdomen closed and the patient made a prompt recovery.

In a recent case of obstruction of the bowel in an old gentleman aged 67, due to volvulus, where practically the entire sigmoid was involved, its surface revealing multiple spots of grayish or whitish discoloration with a general mottling, after freeing the obstruction, we dropped the entire bowel back, knowing that it would surely perforate and form a fecal fistula. Drainage was instituted and in three days feces was coming through the wound. The circumference of the bowel was fully as large as the lower leg and only this kept us from leaving the diseased area outside the abdominal wall. Finally the drainage ceased and the patient's wound healed entirely within seven weeks.

If it be omentum that is strangulated, ligate and excise the diseased portion. If the omental hernia be sloughing or gangrenous, then also excise and ligate, but restore the omentum to the abdomen and drain through stab wounds preferably, especially if the hernia be inguinal in character.

In operating upon strangulated hernia always open the sac and examine the contents, to ascertain the presence or absence of edema, discoloration, slough, or gangrene.

In operating for strangulated femoral hernia, the Moschowitz incision is the one of choice, especially if the hernia be known to have been strangulated for 24 hours or more.

Practically all strangulated hernias will cause death unless operated upon, provided they are irreducible by manipulation. It has been estimated that 8.09 per cent of all operations performed during the first day after strangulation will be fatal; that 22.2 will be fatal if operated upon during the second day; that 45.5 will die if operated upon during the third day; and that 60 per cent will be lost provided the operation be delayed until the fourth day.

In operating it should be remembered that strangulated femoral hernias become gangrenous earlier than strangulated inguinal hernias and that mucous membrane may be gangrenous while the serous coat is apparently still moist and glistening.

The presence of the urinary bladder should be expected and sought for in every case of direct inguinal hernia. We have seen it three times. Unless recognized and protected it may be injured or punctured with fatal consequences. Usually it is evidenced by its prevesical yellow fat, by its increased vascularity, or by its characteristic color.

The best single closure for such hernias, in the maximum number of cases is the Andrews modification of the Bassini technic. It is the one commonly used for all large, direct, or indirect inguinal hernias in the Mayo Clinic. If it be best for the difficult cases, it should also be the best for the easier ones.

It is not always true that transplanting the cord is productive of pathologic changes in the testicle. The cord should of course be handled carefully and gently. Immediately upon completion of the operation, it should be seen that the testicles are not permitted to drop between the thighs. It is this dropping that leads to congestion, enlargement and then atrophy, and not the cord manipulation, provided the cord be not too tightly closed against at the internal ring.

In approximately 500 cases of inguinal hernia where several different types of technics have been used, I remember very few cases in which the testicle swelled and caused trouble, when the scrotum had been properly fixed in an elevated position. In these few cases we were of the opinion that the swelling was due to the Coley stitch being too closely inserted above the cord at its outlet through the internal ring.

In operating for femoral hernia, Ochsner pointed out 20 years ago, the necessity of amputating a portion of the omentum, as he believed that it acts as an entering wedge, thus enlarging the opening for the bowel again to push into. In doing this, however, we must remember that excising a portion of the omentum in some mysterious manner frequently produces a low grade of pneumonitis in the right lower lung. This in reality may be a pulmonary fatty embolism.

Recently, we unfortunately injured the right femoral vein in one case of strangulated femoral hernia. The hernia had been down over 40 hours, there was much edema and discoloration, the patient's general condition was poor and we were hurrying. A lateral ligature was applied after the vein had been clamped. The patient made an uninterrupted recovery, but two weeks after he went home or four weeks after the operaton, the entire right lower extremity began to swell. This has now subsided entirely and the man is at work on his farm. Had we used the Moschowitz incision and operated from

above, as we usually do for this condition, the injury to his vein would probably not have occurred.

In operating for hernias regardless of their location, the important thing to bear in mind is the prevention of wound infection, and the correct approximation of the muscles and aponeurosis of the external oblique, excepting the femoral hernias when they are operated upon below Poupart's ligament. The peritoneum and skin are practically useless as curative agents. They are merely coverings.

DISCUSSION

Dr. J. L. Crook, Jackson, Tenn.—Since about the first of August I have had six cases of strangulated hernia in my small hospital. I lost one and I think I may have lost that one because I failed to do the thing which the Doctor advocated here, and that is of very great importance in a delayed operation where peritonitis has already begun. It is not necessary to discuss the cases that got well, they did as they usually do. The ones we learn most about are those that die.

The case came in after three days of strangulated inguinal hernia with a temperature of 101 and peritoneal symptoms quite evident. She was a young girl fifteen years old and the right ovary along with the intestine was found in the hernial sac. The case was operated upon in the classical manner, but on opening the peritoneum we noticed a very great amount of peritoneal fluid. This fluid was a typical straw color with no evidence of pus microscopically, but there was a great increase in the amount of fluid. When the sac was opened there was a great gush of fluid, probably six or eight ounces. The patient's temperature at the time of operation was nearly 102.

In that case, had I placed a small stab drain or tube in the side away from the site of the hernia, I believe the patient might have had a better chance to survive. I think that particular point is important which the Doctor brought out; whenever we have high temperature or a delayed case where we are in doubt about the existence of peritonitis we should drain. In this case the bowel was restored to the abdomen in practically perfect condition. Hot towels were placed on it, and it brightened up and became normal in appearance and showed no evidence of gangrene. In some strange way there must have been an osmosis from the strangulated bowel into the free cavity of infected fluid which was communicated to the sensitive peritoneum, and this patient died of peritonitis without having had a ruptured or necrotic intestine. A small drainage tube there might have made the difference between life and death.

CLINCIAL OBSERVATIONS IN ORTHOPEDIC SURGERY*

By F. Walter Carruthers, M.D.,
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In this paper I shall not limit myself to any certain subject in the clinical field of orthopedic surgery, but endeavor to interest you in some of the few things that have struck my mind most favorably.

In dealing with the question of weight bearing of the lower limbs I have often been confronted with the difficulty of relieving my patient of pain from weight bearing, following such conditions as Potts' fracture from the simple to the most extreme type, also other fractures and deformities of the lower limb and foot which may need some apparatus to relieve the weight and help the patient to a more successful recovery. I did not originate the apparatus that I shall present to you. I think possibly it has been used in the past, although during my visit recently to a number of the larger clinics I asked particularly about such a brace or apparatus and each time they told me that they did not use it. I have one of the braces here with me for your inspection and shall also demonstrate it to you on the screen.

DESCRIPTION OF BRACE

The brace consists simply of the steel uprights for the inner and outer side of the limb attached to the under surface of the shoe similar to a caliper splint. The main portion of the brace is the leather socket at the upper end which is made to fit just like the socket of a stub for an amputated limb. This is made simply by taking the cast imprint of the limb, after which a mold is made of plaster and the leather socket is made to fit the limb at this point. Due care must be taken to see that the condyles fit perfectly because they are to carry the weight. The patient, after proper fitting, wears it with absolute ease and relief.

This same apparatus can be used and fitted to the thigh in the region of the hip if the case so indicates.

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Another very interesting subject that has come to my observation is the diagnosis and treatment of the questionable bone sarcoma.

The following case will help to demonstrate my point:

Case 1.—Pre-operative diagnosis: questionable sarcoma. Male, age 50 years, married. Occupation: a merchant and farmer. Family history negative.

Came to the hospital complaining of a painful mass in the outer and upper portion of the right leg, just below the knee joint. The patient said two years ago he sprained his right knee, which swelled up and was painful for several weeks and it had felt a little sore ever since. Forty days before, he noticed a swelling and soreness in the upper portion of his leg as above described, which steadily enlarged and became painful, especially at night. The pain radiated down to his ankle. He had kept up and continued with his work. There was no other complaint.

Past History.—Habits are excellent. Denies venereal infections of all kinds. Otherwise the history is negative.

Physical examination.—Working diagnosis, sarcoma of the fibula. Physical examination was negative save for a slight pyorrhea and a saucer-shaped mass which was tender to pressure, but rather firm and resistant in the outer and upper portion of his right leg. After due consideration of history and x-ray findings the patient was advised to be operated upon.

Operation.—Long incision was made over the external surface of the leg, continuing from the knee down about six or eight inches. The skin was retracted and a bulging mass was seen pushing out. This tumor mass we tried to remove *in toto*, but in doing so the capsule was ruptured and a bloody, hemorrhagic, cheesy looking material was seen to flow out in great quantity. The capsule was of a fibrinous nature, and more or less well attached to the surrounding tissue. As shown by x-ray, the entire head of the fibula was destroyed and continued down on the shaft for about four inches. With the Gigli saw we cut the shaft of the fibula about two inches below the apparent line of demarkation. The wound was cleaned out as thoroughly as possible and left entirely open for the placement of twenty-five mg. of radium. This was left in for six hours. One week later the same amount of radium was applied. The radium was screened with silver, brass and rubber. On April 8, 1920, x-ray treatment as follows:

10-inch gap.
2½ mm. current.
3 mm. platinum (to protect skin).
3 min. treatment.

Post-operative diagnosis: hemorrhagic osteomyelitis.

On May 16, 1920, 75 mg. of radium was applied in line of old scar. This was removed in eight hours. The wound was almost healed. On August 1, 1920, 75 mg. of radium was applied in line of old scar over seat of operation. Wound healed. Advised to return in three weeks provided no radium reaction existed. Physical examination at this time showed wound entirely healed. No signs of metastasis of any kind.

There have been many articles written in the past on this subject,[1] and they all seem to leave us very much in the dark as to a definite diagnosis and treatment. I am in hopes that in presenting the above case some interesting discussion will be brought out. When I make the statement that we are left more or less in the dark, I am referring to the border line cases of so-called sarcoma. From this standpoint in reviewing the literature, I fail to find anything definite.

Bloodgood in 1910 remarked that in many surgical lesions technic is ahead of diagnosis. This statement undoubtedly contains a very important truth. The diagnosis of obscure bone pathology is difficult, and at present still uncertain. To many surgeons the existence of bone cysts is unknown. This ignorance alone has led many to perform operations of magnitude which were not justified. On account of the lack of sufficient evidence at times both from pathologic, microscopic and x-ray as well, to base a diagnosis of sarcoma it is better to practice conservatism than to subject our patients to severe radical operations when not necessary. In these doubtful cases where you have even the presence of giant cells and the tissue from a macroscopic as well as the clinical findings in a border line case, we should practice conservatism.

There are only four types of real sarcoma: fibro-sarcoma, myxo-sarcoma, chondro-sarcoma, and osteo-sarcoma. I feel that George Berrie[2] was about right when he said that most of the so-called osteo-sarcomas are in reality nothing but a hemorrhagic osteomyelitis. Conservative treatment will no doubt cure many of these cases which might otherwise prove fatal. At least it may save the patient from undergoing a radical operation with possibly the loss of a limb and therefore be a real cripple for life. I feel the question of radium and x-ray in these cases plays just as important a part here as it does in any other conditions in which it might be indicated.

We realize that a large amount of material should be the foundation for conclusions in the vast majority of cases we present. It is therefore with some hesitancy that I bring before you a small amount of work. Still some valuable deductions at times come from a limited number of cases observed in private practice.

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DISCUSSION

Dr. Edward S. Hatch, New Orleans, La.—I see practically no cases of sarcoma, because in our section of the country the general surgeon feels that these cases belong to him, and consequently he does not refer them to the orthopedist. There is one case, however, that I should like to say a few words about which at the time was of great interest to me.

This patient was first seen on January 31, 1916, with the history that three months previously she began having pain in her left knee and in the lower part of her leg. Her doctor said that it was a referred pain from trouble in the pelvis.

Examination showed a well developed and nourished woman, who walked with a limp on account of pain in the knee. There was marked tenderness and some swelling about the knee. The x-ray showed a large rarified area in the head of the left tibia, which was thought to be a Brodie abscess. Operation was advised and refused.

June 3, 1917, patient returned and was willing for operation. Pain and discomfort had been steadily increasing. At the operation a large cavity was opened in the head of the tibia, which was full of broken down tissue and some pus. The pathologist reported inflammatory tissue with giant cells which he did not consider malignant. The cavity in the bone healed rapidly and the patient was perfectly comfortable. Nine months later, when she was standing on her lawn, she took a step forward and fell. Examination showed a fracture of the middle of the right femur. X-ray showed a large cyst of the femur with fracture through the cyst. At the operation a blood cyst of the femur was found, cleaned out, and bone ends approximated.

The pathological report showed no sign of malignancy. I felt at this time that the case represented sarcoma, especially after the femur fracture, but with the negative pathological report we hoped for the best until the patient gradually developed more cysts and tumors in the right radius of the left femur and sternum. Coley's treatment was tried, but had no effect on her condition, and she died in about three months.

INTERNAL DERANGEMENTS OF THE KNEE JOINT*

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Disabilities of the knee joint produced by injuries other than open wounds and gross fractures are of very common occurrence in civil as well as military practice. The complexity of its anatomy and the different structures that may be injured make a discriminating diagnosis and proper special treatment essential to the best possible function of this important joint.

The conditions referred to as internal derangements include:

1. Injuries to the semi-lunar cartilages.
2. Simple traumatic synovitis.
3. Hypertrophy and pinching of postpatellar fat pads.
4. Sprains of the lateral ligaments.
5. Loose bodies in the joint.
6. Rupture of the crucial ligaments.
7. Fracture of the tibial spine.

Bursitis, fracture of the tibial tubercle and patella and rupture of patella ligament and quadriceps tendon and infections are not included in this subject, though they may be easily mistaken for or overshadow one or more of the internal derangements. I shall discuss in detail injuries of the internal semilunar cartilage, mentioning the other conditions only to differentiate them from cartilage injury.

OCCURRENCE

Injury of the internal cartilage is a very frequent accident, about fifty times as frequent as injury of the external one. During my two years' army experience I personally operated upon approximately forty cases, one of which was an external. These cases were only those in my services which had had prolonged or repeated attacks of trouble and one or more "lockings" of the joint. Since a large per cent

*Read in Section on Orthopedic Surgery, Southern Medical Association, Fourteenth Annual Meeting, Louisville, Ky., Nov. 15-18, 1920.

of cartilage injuries do not have definite locking and another large proportion who do have it at first are reduced and recover, it will be seen that these forty cases were a small part of the total injuries. The exact per cent of cases that have persistent trouble and one or more definite lockings justifying operation I have been unable to determine. Moreover, I witnessed about the same number of operations performed by other surgeons in the Service. These and the large number of cases which did not require operation ran the total number seen well into the hundreds. I am sorry I can not give accurate statistics, but only part of the records are available. Jones, who has done most toward clearing up this subject, stated that he had operated upon more than 2,000 cases up to 1917. Only one of my cases was an external cartilage and I saw one other operated upon at Shepherds Bush Hospital, London, by Major Elmslie, R. A. M. C.

CAUSE

This may be direct trauma such as falls on the knee, kicks and other blows or indirect force usually described as a twist or wrench. It is common in miners and footballers, and was often seen after vaulting practice, jumping ditches and slipping on slippery duck boards in the trenches.

Since one usually has to depend on the patient's account of the accident, it is often difficult or impossible to find out just how the forces were applied, the exact position and movements of the leg and thigh at the time of the injury, and whether there was not also an element of indirect force in the cases of direct violence. But in a very large proportion of cases one gets a history of inward rotation of the thigh on the leg as the latter is fixed by contact of the foot with the ground, the knee being flexed and thrown inward; that is, flexion, abduction and outward rotation of the tibia on the femur. Any sprain or injury of the internal lateral ligament may be associated with internal cartilage disturbance because of the attachment between these structures.

The physics of the application of forces which produce some of the conditions found at operation is difficult to explain exactly. For example, the most common pathology found in my cases was a longitudinal splitting of the cartilage, the strip nearer the center of the joint being free except for the anterior and posterior attachments and frequently passing through the intercondylar notch, having slipped outward beneath the inner condyle of the femur. In one case the cartilage was split longitudinally into three separate strips, two of them free except at their extremities and one of the latter lying between inner condyle and crucial ligaments while the other lay near its normal position. The third strip or remnant was attached to the coronary ligament in the normal situation. Why one case will be split in this manner and another fractured transversely or obliquely or partially or completely detached from the coronary ligament has not been positively explained.

After some study of this problem I have a theory which it seems to me might explain the splitting of the internal cartilage. It is this: the splitting begins at the anterior portion where the cartilage normally divides into two bands, one attached to the coronary ligament and the anterior margin of the tibia just internal to the patellar ligament, while the other or posterior division passes across as the transverse ligament and is continuous as the anterior portion of the external cartilage. When the internal condyle rotates backward, tension is made on the anterior divided portions which are attached as above at widely divergent points, thus starting the split. With the longitudinal direction of the fibres of this fibro-cartilage this splitting could easily extend toward the posterior end of the meniscus with a continuation of this force. If you will forcibly flex, abduct and externally rotate your own tibia on your femur, you will feel the tension and pain at this front inner part of the joint.

Lesions of the external cartilage, while far less frequent, are even more difficult to explain. The one case which I operated upon was split longitudinally and the free strip was lying in the inter-condylar notch. This case had previously had an excision of the internal cartilage of the same knee by another surgeon with persistence of

symptoms and recurrence of typical locking. Whether there could have been a mistake in diagnosis I could not learn. But I opened the joint through a patella-splitting anterior incision so as to explore the whole joint, since we were not certain as to the cause of the renewed locking, and found the condition stated and also a marked degree of general synovitis. This patient had a slow and incomplete recovery at the end of three months, when last seen.

SYMPTOMS AND DIAGNOSIS

An accurate history of the original accident and subsequent symptoms is of the greatest importance in arriving at an accurate diagnosis. First let the patient tell his own story, then question him in detail: as to position of limb, the kind and direction of force applied, whether he felt a slip or crack with sharp pain in the joint and exact location of same; whether he could walk immediately or had difficulty straightening the knee, and if so, how he managed to get it extended; whether there was swelling and discoloration afterward and the amount and duration of same; also whether he completely recovered or had persistent or recurrent symptoms with or without attacks of locking, with accurate details. The symptom of locking means inability (sudden) to straighten the knee because of mechanical blocking by a portion of the cartilage or a loose body being caught between the articular surfaces of tibia and femur. It is the most important single fact to be determined from the history. Considerable time and much questioning may be required, being careful to avoid leading questions, in order to ascertain whether there has been a true locking or not.

If the patient tells a clear story of having twisted his knee inward while it was partly flexed, at the same time feeling a sudden, sharp pain at the front inner aspect of the joint, often with a sensation of something slipping or giving way in the inner part of the joint, followed immediately by inability fully to extend the knee until after some manipulation it suddenly straightened out, you may be quite sure of a torn and displaced internal cartilage which has been reduced. Of course one should also look for the corroborative physical signs which are pretty sure to be present.

Probably more than half of such cases promptly reduced will heal in place and recover, but many of them will have persistent weakness instability, pain and swelling on use and recurrence of locking which indicates a permanently loose or deformed cartilage. There is little hope of cure without operative removal where there is a second attack of locking a month or more after the injury. The above symptoms may persist without definite locking, due to a thick scar or slightly loosened attachment of the cartilage, which may or may not require operation depending on the severity of the symptoms and the occupation of the patient.

A frequent type of case is this: the joint unlocked or rather was straightened by a companion or by a surgeon, under anesthesia, possibly, but extension of the knee was never quite complete. This condition with the other characteristic symptoms persisted, getting better, then worse, especially on use, with or without repeated locking. About half of my operated cases had such a history, and findings with this slightly incomplete extension at time of operation. In every one of these I found the internal cartilage split longitudinally with the free strip lying between the condyles. Such cases of persistent displacement require operation and with such treatment usually get a very satisfactory result, the promptness of recovery depending on the degree of synovitis present.

It should be remembered that not every cartilage injury will have locking of the joint, either immediately or later. Severe tears may occur without displacement sufficient to block extension and it is certainly not to be expected in all cases of pinching, bruising or slight tears of its attachments. And when this symptom is absent the diagnosis must depend more on the physical signs and can not be made with certainty in a great many cases. And when in doubt always give conservative treatment a thorough trial.

A very important physical sign is localized tenderness at a point one-half to one inch internal to the patellar ligament on

a level with the upper margin of the tibial tuberosity, that is, over the anterior portion of the internal cartilage. Sir Robert Jones calls this the "diagnostic point." Pain at this same point on forced extension of the knee is also usually present and is of equal value. But some cases have most pain and tenderness at the inner aspect of the joint and may be hard to differentiate from sprains of the internal lateral ligament, which conditions are often associated, as mentioned. In a simple sprain the tenderness is apt to be more diffuse and not so definitely localized at the level of the joint line as in cartilage tears.

Acute or chronic synovitis with free fluid may be present, depending on when the case presents itself. There may be only weakness, localized tenderness, a dull ache on overuse and slight muscular atrophy of thigh if seen in the chronic stage, but if with these signs one gets a typical history a positive diagnosis can be made.

Occasionally a loose portion of the cartilage can be palpated as a small movable mass at the antero-internal aspect of the joint, but this is rare and is apt to be deceptive. X-ray examination is usually of no value except to help exclude some other conditions.

In injuries of the external cartilage the tenderness and pain are over the outer aspect of the knee at the joint line, not so much to the front and not so definitely localized as in internal cases.

Thickened post-patellar fat pads show a tender doughy swelling on each side of the patellar ligament, the size and firmness being increased when the knee is fully extended with the quadriceps strongly contracting. Soft crepitus, cracking and grating are often felt under the patella on active movements of the knee. Flexion of the knee may be limited, but not extension. No history of locking.

"Joint-mice" or Loose Bodies.—These may be palpated at times in varying locations in the joint cavity as unattached particles, and the patient often discovers their presence before any symptoms develop. They occasionally cause locking and synovitis, but there is not the characteristic localized tenderness and pain on extension that we find in cartilage injury. They are frequently calcareous and show in a radiogram.

Rupture of a crucial ligament is usually associated with a dislocation or other severe type of trauma. If both ligaments are ruptured there is preternatural mobility when the knee is fully extended; if only the anterior crucial, forward sliding of tibia on femur is possible when knee is extended; if the posterior crucial, there is abnormal backward sliding of tibia on femur when knee is held flexed. Both ligaments check inward rotation of the tibia, which check would be lacking. Tenderness is not localized and there is no history of locking.

Fracture of the tibial spine has not the characteristics of cartilage injury and is easily differentiated by the x-rays.

Simple traumatic synovitis, not associated with other pathology, has free fluid in the joint as evidenced by swelling, which is most marked over the supra-patellar pouches, floating of the patella and fluctuation without the localized tenderness and locking and other features of cartilage injury.

TREATMENT

This will depend on the stage at which the condition is seen. If it is early, and the knee is still locked, the effort should be made at once to reduce the displaced cartilage to its normal position. This may be very easily accomplished, or it may be impossible. If perfect reduction is obtained within a day or two following injury there is a good chance of reattachment with healing and a good recovery. The patient may effect the reduction himself even at the initial injury, and if there are recurrences he soon learns the trick of it.

The best manipulation for obtaining reduction is probably that described by Jones. This combines active and passive movements. The patient lies on his back with hip and knee flexed; the surgeon grasps the foot with one hand and places the other on the front of the injured knee. On giving the word "one-two-three-kick" the patient makes a sudden effort to extend the knee while the surgeon rotates the

foot and leg inward while assisting the sudden extension. If reduction occurs the knee will go into full extension with the patient feeling a sensation of the obstruction slipping away, followed by a sense of sudden relief. If the knee can not then be fully and easily extended and when such effort is made feels the same pain at the "diagnostic point," then reduction is not complete. Another similar effort is made with the additional movement of abduction of leg on thigh during the manipulation. If a few efforts fail the same is tried under a general anesthetic. If all efforts fail the joint should be put at rest with local applications for a few days and then operative removal of the cartilage performed.

Jones says that even though the displacement may have been present for a fortnight or even a month, there is still a good chance that a cure may result if reduction can be made.

The after-treatment consists of elastic compression and fixation of the joint on a straight posterior splint for ten to fourteen days, followed by masage, heat and gradually increasing movements. This same treatment applies to cases which have not definite locking, but which have synovitis and other evidences suggestive of cartilage injury. Jones also believes that many cases persistently show symptoms because of adhesions and slight displacements which can often be relieved by the above manipulation under gas and he practices this frequently, as I have witnessed, in his own clinics. I have done this myself many times for these persistent and doubtful cases and have not been encouraged by my results. These remarks do not, of course, apply to cases with definite displacement and locking. In the after-treatment of all knee injuries of this class Jones, Bristow and others lay great stress on the importance of maintaining and restoring power in the thigh muscles, especially the vastus internus which is so important to the stability of the knee and which they believe is subject to atrophy more than the other thigh muscles because of special reflex nerve connections. It was our routine practice, as in all the British orthopedic hospitals, to employ the Bristow faradic coil and his special method of graduated muscular contractions for the thigh mucles in these cases.

Where conservative measures fail and one is certain of a cartilage injury the treatment is operative removal of the offending cartilage. As a rule one should be reasonably certain of the diagnosis before resorting to an arthrotomy, but occasionally it seems justifiable to explore a doubtful case which continues to give serious trouble in spite of conservative measures.

It has been the general opinion that the knee joint was more easily infected than other tissues and even other joints. This belief is incorrect, though it has in the past probably saved many a knee from serious damage, not to mention many lives. But it has also resulted in countless numbers of people going through life more or less crippled in a manner which we now know can be safely prevented. The fact is that the joint has a very good resistance to infection, as was proven by the closed method of treating certain war wounds of this joint. However, when infection does occur the results have been serious if not disastrous because of the complex anatomy of the joint and the great difficulty of getting efficient drainage. The Willems method has helped greatly in this respect.

No pains should be spared in protecting the joint against infection, and careless opening of its cavity is as much to be condemned now as ever. But we know that arthrotomies can be done with safety in these clean cases and that gratifying results can be obtained where indicated if a proper technic is employed, taking particular care not to traumatize the other delicate internal structures. About eighty such arthrotomies were performed by my associates and myself in British and American war hospitals without a single infection. The technic which we employed was, with slight modifications, that recommended by Sir Robert Jones.

Skin preparation on two days prior to operation; tourniquet at middle of thigh after applying an Esmark bandage; skin iodined, then knee wrapped in a cloth sat-

urated with biniodid of mercury solution 1:2000. The leg is allowed to hang over the end of table at right angle to thigh. An oblique incision is made, through cloth and skin, over the front of knee internal to patella; cut edges of cloth clamped around skin edges. The fibrous capsule, the more or less thick fatty layer beneath and finally the synovial membrane are successively incised, much as one would open an abdomen. The incision is usually not more than an inch and a half in length. Blunt retractors are introduced and by retracting forward as well as laterally while the leg is abducted and rotated externally and using a blunt hook, one can very satisfactorily examine the inner half of the joint cavity, including crucial ligaments and tibial spine. All structures are carefully examined and if there is evidence of injury to the cartilage excise all or at least the anterior two-thirds of it. For this purpose a straight bistoury is usually employed, but I prefer medium sized, curved-on-the-flat Mayo dissecting scissors. The anterior end of the cartilage having been freed and grasped with strong mouse-toothed forceps, strong traction is made on it while it is separated with the scissors from its attachment to coronary and internal lateral ligaments and finally clipped off as far back as possible. I feel sure there is less danger of trauma to the synovia and articular cartilages by the use of the blunt-pointed scissors than when the bistoury is used; also less danger of leaving a ragged surface which might cause trouble.

Nothing should go into the joint except the parts of instruments which have not been handled; also, possibly, a small bit of gauze to clear out blood-stained joint fluid. Synovia and capsule are closed in layers, tying sutures with instruments. Skin is closed with s. w. g. No marked flexion or extension of joint should be made while the wound is open to prevent inspiration of a possible air-borne infection. A copious dressing with moderate compression is applied, then the tourniquet is removed and the limb placed on a straight posterior splint for ten days. Massage, Bristow and graduated movements usually complete the treatment in three to six weeks.

EYE, EAR, NOSE AND THROAT

ENUCLEATION OF THE EYE WITH GLASS BALL IMPLANTATION*

By J. B. Stanford, M. D.,
Memphis, Tenn.

This paper is really a plea for the conservation of the patient's good looks. The only function of an artificial eye is to improve the personal appearance, and if the operator does not make every effort to leave a satisfactory stump for the prosthesis, he is neglecting his duty as a surgeon. We doctors, who are accustomed to looking at physical deformities, sometimes forget that facial deformities, and especially artificial eyes, are often repulsive to the laity. The two chief faults with most artificial eyes are lack of motility and a sunken appearance. We must bear in mind that the patient and his family must live with his glass eye, so it behooves us to make his existence as pleasant as possible.

Many operations have been devised to remedy the defects of the Bonnet enucleation operation, all of which have their disadvantages. The very fact that so many procedures are proposed is proof that none is entirely satisfactory. The procedure which gives the most satisfactory cosmetic result is without doubt Mule's operation, i. e., insertion of some sort of ball within the sclera. In the opinion of the writer, this operation should be discarded owing to the fact that so many cases of sympathetic ophthalmia have been reported following its use. I have not seen any late data on this subject, but eighteen cases had been reported up to 1908.

Among the materials which have been used to implant in the capsule of Tenon are celluloid, sponge, peat, bone, agar-agar, vaseline, gold, rubber, wire, silk, catgut, fat, fat and skin, rabbit's eyes, paraffin, cartilage and glass. The most serious objection to the implantation of tissue is that it is apt to be absorbed. This has been proved by those who have employed fat, rabbit's eyes, etc. The most common objection to the use of foreign materials is that they are apt to be extruded, or as in the case of wire spheres, that they become so firmly adherent to the tissues of the orbit that they cannot be removed readily in case of necessity. The additional objection to paraffin is that it is prone to change its location. Of course, another serious objection to implanting the precious metals is the cost of these material.

The idea of using glass for this purpose was conceived and executed simultaneously by Frost and Lang in 1887, and the procedure is generally known as Frost's operation. The technic used in my cases was given me by Col. Allen Greenwood, of Boston, and I have followed it exactly in all cases except one, which will be mentioned later. The glass balls are hollow and are made of lead-free glass, in a number of sizes. I have found only three sizes useful—18, 20 and 22 mm. It is usually good practice to employ the largest ball that can easily be put in Tenon's capsule.

The steps of the operation are briefly as follows: first, the conjunctiva is detached from the sclera at the corneal margin and elevated from the globe as in the ordinary enucleation. The muscles are then successively caught up on a strabismus hook, and a white silk suture is tied near the insertion of each before it is severed from the globe. One arm of this suture is left long. The globe is then removed in the usual manner and the bleeding is completely stopped before the next step, which consists in the introduction of the glass ball. The ball is put in the capsule of Tenon and the capsule is closed with a purse string suture of white silk. The recti are then tied together over Tenon's capsule making use of the sutures which were placed before the muscles were severed from their insertions. The superior rectus muscle is tied to the inferior and the internal to the external. They should be brought together so that the ends lap for 4 or 5 mm. The final step

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is the closure of the conjunctiva after which a pressure bandage is applied and allowed to remain 48 or 72 hours.

I have done this operation fourteen times, and in the second case I modified the technic by using catgut instead of silk sutures. The ball came out on the fifth day after operation, and I lost the filling effect of the ball but I retained good motion owing to having tied the muscles. In two cases the silk sutures irritated after three or four weeks, but they were removed without difficulty.

In all of these cases which I have seen after the artificial eye had been fitted, the motion was good up and down and to the nasal side and the eye was as prominent as the other except in the one case where the ball was lost. Motion to the temporal side is never good after any enucleation. I believe that some form of implantation operation should be done in all cases of enucleation where it is not positively contra-indicated, and I am convinced that in all cases the surgeon is remiss in his duty if he does not tie the muscles as described above.

DISCUSSION

Dr. George H. Savage, Memphis, Tenn.—Of the various implantation operations this one described in the paper is to my mind the best, for two reasons. First, it fills up the socket better than any operation I have seen, and gives the eye much more motion than you get from any other implantation operation; and second, you are less likely to have sympathetic irritation because it is not imbedded in the sclera. In all operations, especially about the face, we should have in mind the appearance of the patient and while we have this in mind we should not forget his safety, not only at the time of the operation but in the future. For that reason I am inclined to doubt that any of these implantation operations, although they give better domestic effects, should be done in every case. In some cases, of course, you will never get irritation of any kind; in others you will. Do not sacrifice the safety of the patient for the cosmetic effect.

I think another reason we have trouble with artificial eyes is that we do not take care enough in fitting. If we spent a little more time in putting in the artificial eyes we should get better results, without the risk of sympathetic inflammation which risk is run in the implantation operation.

Dr. William T. Davis, Washington, D. C.—Dr. Stamford's suggestion that we should not enucleate eyes without substituting something to take the place of the removed globe is very good. My experience, however, with the glass ball implantation has not been satisfactory. I remember one case that had a very ludicrous ending, that might have been tragic. I implanted a glass ball following an enucleation of the right eye of a young man from the country. He was sitting at the cross-roads store discussing the questions of the day when the eye suddenly exploded. The sudden change of temperature, it being cold weather, caused the explosion. Removing the glass from the socket was an exceedingly difficult matter. He threatened suit, which fortunately did not come off, after the situation was explained to him.

It seems to me that in selected cases the implantation of fat is a most successful method of filling the eye socket. Of course, the fat is absorbed and is replaced by fibrous tissue. In my hands this operation has been satisfactory, more satisfactory than the implantation of any foreign material.

Dr. Charles Bahn, New Orleans, La.—Four things can happen in foreign body implantation: the implant will be encapsulated, extruded, absorbed or vascularized. Both the gold ball and the glass ball have their respective advantages and disadvantages. The question of low-grade infections will probably mean the extrusion of the ball and I believe in the course of time all will be extruded. In the case of fat, it will be absorbed. I firmly believe that what happens in fat implantation is that the fat itself is actually absorbed. The connective tissue remains and that forms a foundation for vascularization. In other words, in most living tissue implants the tissue itself dies, but it leaves a foundation for vascularization. I think the time will come when this will be done with some porous substance.

The question of suturing the muscles does not seem to be of such very great importance as we used to believe. The muscles are bound down with scar tissue and they stay pretty much in the same position whether you suture them or not.

As regards the cosmetic effect, if you will recall the unpleasant appearance is due to an increased fold in the lid. The excision of small pieces of skin has given us a good cosmetic result, of course with a fairly perfect fitting eye.

Dr. George Maxwell, Roanoke, Va.—I have never done an implantation of a gold ball or glass ball in the eye. Some years ago I accidentally found out that there was a very easy way of relieving the sunken appearance of the eyeball without resorting to implantation of any kind. One day a patient upon whom I had done an enucleation and whose eyeball was sunken, developed a furuncle on the upper lid. In injecting cocain to dissect that area I found out that the hollowness was relieved and the man looked very well. I got two or three cases I had operated upon who had this same sunken appearance and injected each one with a saline solution in the middle of the upper lid and the cosmetic effect was wonderful. After they saw

how it worked they consented to let me use paraffin just as I had the saline solution. Paraffin worked well in relieving that sunken condition and giving a perfect cosmetic result.

With one man I got a little enthusiastic and put in too much paraffin, and he has a bulging of the upper lid, but it looks better than a hollow space. I used ordinary paraffin, melting point 110°, mixing it with sterile vaseline, equal parts, and injecting it at a temperature of 120° with an ordinary syringe. First inject normal saline solution, then in two days inject the same amount of paraffin as of the saline. In that way you avoid getting too much or too little and the resulting cosmetic effect is very good. The sunken upper lid is due to a fold of the lid, not to the eyeball not being far enough forward. Getting the eye far enough forward and implanting tissue helps to fill it, but it does not act so nicely as paraffin.

Dr. Stanford (closing).—Dr. Savage spoke of irritation. I have never seen irritation following glass ball implantation, but my partner, Dr. Ellett, had one such case.

Dr. Davis spoke of fat. I have no objection to the implantation of fat or other materials. The point I wanted to bring out is that the day is past when the doctor can take a button hook and a pair of scissors and do an enucleation and get away with it. We must do more for our patients than that.

Dr. Bahn spoke of low-grade infections as causing extrusion. An infection of that sort is a contraindication to implantation of any kind of material.

Dr. Moore spoke of paraffin. Paraffin is very apt to change its position, though it may be all right for a while.

THE SEARCY TONSILLECTOME*

By Harvey B. Searcy, M. D.,
Tuscaloosa, Ala.

The principal feature of this instrument is its extreme simplicitiy in construction and operation. All snare wire troubles, double blades, etc., have been eliminated. Any tonsil that can be removed with the Sluder technic and its modifications can be removed with this instrument.

The instrument consists of—

First, a dull sliding blade that slides back into a box, the edges of the blade are rounded and the attachments of the tonsil are squeezed off with the ecraseur and very little hemorrhage results.

Second, a spear has been added to hold the tonsil after it has been "squeezed out."

Third, a large thumb ring permits the instrument to rest firmly in the palm of the hand.

This instrument is only slightly modified from the one first described by me in the *Laryngoscope* in 1912. There is a heavier sliding blade and the supporting ring is thereby eliminated. The spear and large thumb ring are added.

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The Searcy Tonsillectome

MEDICAL EDUCATION

THE EDUCATIONAL PREPARATION FOR MEDICINE*

By Robert Wilson, Jr., M.D.,
Charleston, S. C.

Before we can discuss intelligently the educational preparation for medicine, or, indeed, for any profession, we should endeavor to formulate as clearly as possible the function of education and what it is intended to accomplish. Two views are possible. In the first place we may regard education as definitely utilitarian; in other words, as being primarily for the purpose of affording preparation for the special calling or profession in question without regard to any general cultural value it might possess, deeming only such knowledge essential as may be useful to the attainment of the desired end; or, on the other hand, we may consider the fundamental purpose to be mental training, and while certain utilitarian studies form a necessary part of the scheme, the main object is to afford mental culture and discipline.

The distinction between these two educational theories is very ancient. Aristotle says that

> "No one knows on what principle we should proceed. Should the useful in life, or should virtue, or should the higher knowledge be the aim of our training,"

and in maintaining that education should not be directed towards utilitarian ends alone, he makes the acute remark that

> "Nature herself, as has been often said, requires that we should be able not only to work well, but to use leisure well."

Education should aim to afford a clear understanding of our relation to the world, organic and inorganic, from which we spring and in whih we live, and of the social world of which we are a part and in which we move and have our being; it should aim to develop all of our faculties, each to its fullest capacity, recognizing that the most efficient machine is one whose several component parts run smoothly and in harmony, but not losing sight of the fact that the mind is something more than a mere machine, and that love of the good and appreciation of the beautiful are as justifiable ends as the quest of the true; it should aim to enable the student to discover for himself his likes and dislikes, his attractions and repulsions, his aptitudes, his powers and limitations, that he may be in a position to choose wisely the special medium through which he may express himself to the best advantage, how he may make his life, so to speak, in the highest degree articulate. Education should stimulate creative imagination, should train and exercise the logical faculty and develop the capacity for independent thinking, should strengthen the will, and withal should provide the emotional stimulus which may be required to activate the latent energy of the mind and give a dynamic expression to potential power.

Every boy has ambition, latent or active, and not the least important function of education is to give it direction and to inspire the right kind of idealism. The spur which forces ambition to assert itself does not operate through reason, but through the emotions, and literature is the medium of its expression. In beautiful metaphor Carlyle expresses a fundamental truth when he tells us that

> "Without the music of some inspired Orpheus was no city ever built, no work that man glories in ever done."

And while he may hesitate, and justly, to accept this philosopher as a reliable guide, we can not forget that Tyndall, one of the clearest thinkers of the Victorians and a master of experimental science, testifies to the practical value of emotional stimulation when he informs us that Carlyle and Emerson made him a physisist through the inspiration of their writings, and he adds that if a man but observe himself he will probably find that

> "In nine cases out of ten the emotions constitute the motive force which drives his intellect into action."

Only a few months ago another practical scientific worker better known to men of this generation, Sir Ronald Ross,

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adduced further evidence of the value of the emotions to scientific achievement in his address on "Science and Poetry" delivered at the Royal Institution last June.

The range of problems which confront the medical student and the physician requires that he should have a broad and comprehensive mental training and a varied mental equipment, and in discussing what kind of education best may fit him for his work, we should look beyond the period of undergraduate study and take account of the social, economic and psychological problems he will encounter when he enters the arena of life. The living human being is not reducable to mere physical and chemical reactions; he is a psychological being as well, and is the product of a long and complex heredity modified by his peculiar social environment, an understanding of which facts is essential not only to the proper handling of patients, but to the comprehension of the social and economic bearing of pathological conditions.

In answer to the question which arises at this point as to what course of study is best adapted to accomplish these ends and to qualify the student for his life work, I wish to express my own deep conviction that a literary and classical course of study enriched and broadened by science is the ideal, and I would add that early specialization, while it may, indeed, save time, which is its purpose, leaves little opportunity for the cultivation of those qualities of mind which may be classified broadly as the emotional and which is best accomplished during the plastic and impressionable period of mental growth. It is a mistake for a youth to decide upon his life's work and enter upon special preparation therefor before he has given his mind a chance to grow in all dimensions, and I feel that our minimum requirements tend to encourage this very thing. I appreciate fully the necessity of our present course under existing conditions, but it is not sufficient and satisfactory and should not be advised except when unavoidable.

For a long time the classics constituted the only foundation of liberal education, but with the growth of the sciences in the last century there developed a strong feeling against the study of the ancient languages as a useless waste of valuable time. I am convinced, however, that when properly taught the study of these languages affords a mental discipline that is difficult to replace besides giving a kind of culture which can be obtained from no other source. To quote Tyndall again:

> "If I except discussions on the comparative merit of Popery and Protestantism, English grammar was the most important discipline of my boyhood. . . . But knowing the value of English so well I should be the last to deny, or even doubt the high discipline involved in the proper study of Latin and Greek."

It is necessary to insist upon the proper method of teaching in order to derive the highest value. When I was in college I was fortunate in having an old German professor who possessed a rare genius for teaching, and I am confident that I do not overestimate the importance of the mental discipline received from his drill in Latin and Greek. I learned concentration, accuracy of observation, attention to detail, analysis and synthesis, and these mental habits went with me later into the laboratories of science and found a practical application in a wholly different field. But this was not all. Besides receiving mental discipline, contact with the literature in which the ancient culture of Greece and Rome found expression, gave me broader and deeper human sympathies as well as a better understanding of our own social environment and enriched my life by affording a juster appreciation of the beautiful in literature and in art, and lastly but by no means least, it gave me a truer knowledge of the structure and use of our own language and a finer appreciation of our incomparable literature.

These ends can not be attained in the same degree by the study of a modern foreign language, although if thoroughly taught modern languages have the added advantage of being more definitely utilitarian. If a modern language is to be a prerequisite for the study of medicine, we should specify not the length of time of study in units, or in years, but that the student prove that he has acquired a reading knowledge of the language in question. A short course is not justified by either its cultural or its utilitarian value.

It should not be necessary to comment upon the importance of a more thorough training in English language and litera-

ture, but my experience with young men who have finished a college course, in part or in whole, convinces me that sufficient attention is not given to this fundamental branch of study. A knowledge of English is basic. While it is true that every one can not acquire equal facility in its use, every one at least can learn correct English, but I fear it is a just commentary upon educational methods that many college-bred students do not understand the use of their own tongue.

A word here about the study of biology may not be out of place. Biology may be considered as having both cultural and utilitarian value. I do not think that any scheme of education is fully entitled to be called liberal which omits a subject which has revolutionized thought in every field of human activity, modifying profoundly even some of our most deeply rooted religious beliefs, whose fundamental laws permeate the entire social structure and illuminate many of its perplexing problems, as well as constituting an essential part of the foundation of medicine which is but one expression of applied biology. In requiring biology, however, as a part of the preparation for medicine it seems to me that we should insist upon the kind rather than upon the amount of biology that is taught. The student should learn the general laws of plant and animal life, the principles of evolutionary development, the principles of heredity, the structural as well as the genetic relationship between man and the lower animals, with laboratory demonstrations illustrating the principal types.

It is not the purpose of this paper to mention in detail all of the subjects which might find a place appropriately in a plan of liberal education, but I should like to refer to sociology and psychology which have a very definite application to medical practice. The organization and development of the body social and the laws which govern mental operations appear to me to be highly important fields which have not been sufficiently cultivated. If psychotherapy is to be properly understood, the principles which underly its application must be predicated upon a knowledge of the general principles of psychology.

Enough has been said to indicate my belief in the importance of a broad and comprehensive culture rather than a training which begins a special direction too early and also in a general way my views of what such a course should consist. The most serious difficulty which I see to an education that is planned on these liberal lines is the length of time that will be required to carry it out. The average young man who studies medicine after completing a full academic course of study and further prepares himself by a year or more of internship is well beyond the middle of his third decade of life before he is in a position to earn a livelihood. This is necessarily a serious drawback, but let us not make the mistake of sacrificing too much of culture to save time. In order to abridge this lengthy period and to shorten the course of study without depriving the ambitious student of the opportunity of obtaining an academic degree, the combined course is offered by a number of colleges under the terms of which the student enters the medical school at the end of two or three years of college work, and receives the B.S. or B.A. degree together with his degree in medicine at the expiration of his professional studies. This, however, fails to meet the real difficulty and is of very questionable value. The medical course undoubtedly possesses a high cultural value, and if properly pursued is a liberal education in itself, but it does not meet the ends of academic instruction nor is it intended to do so. I feel, too, that the combined course tends to set up wrong standards of value and to create in the students' mind the idea that the goal to be reached is the degree rather than the culture which the degree symbolizes. Furthermore, if six or seven years of combined study possess a culture value represented by the A.B. or B.S. degree in addition to the medical degree, should not two additional years of culture study entitle the student who takes his B.S. or B.A. degree before entering upon the study of medicine to a higher degree, at least to the degree of M.A.? Is it quite fair to draw no distinction between the culture of a young man who leaves college at the end of his sophomore year and that of a young man who pursues to its completion the full academic course before entering the medical school? Personally, I

do not think that these two stand upon the same culture level and that some distinction should be made between them.

The real difficulty of the situation, in my opinion, lies in the primary and secondary schools. While I am not prepared to offer a definite suggestion with regard to what changes may be required or may be practicable, I am impressed, nevertheless, by the feeling that precious time is wasted in these preparatory years and that it may be possible to shorten the term of school study, and at the same time perhaps to enlarge the field so that the student may be prepared to enter college at sixteen or seventeen. This is not infrequently done in selected cases by intelligent direction and I believe that by employing different methods from those in vogue it can be accomplished with the majority of pupils.

Our present methods of teaching do not seem to inspire boys and girls with the proper ideals. A teacher whose education was received in Europe remarked after teaching a short time in an American college that in Europe boys studied to learn, but in America the object of study seemed to be to pass examinations, the pupils not appearing to care anything about learning. Is not this a natural result of a system which is too mechanical and which consequently tends to create false standards? I realize fully the value of standardizing our teaching and of adopting a uniform terminology by which to express these standards, but the human mind is very prone to fall a victim to the fallacy of mistaking the symbol for the real substance, illustrations of which are fairly abundant. The unit system which is employed almost universally in this country is a convenient means of expressing the amount of work done and its educational value. It is a useful language which all of us understand and which makes communication easy, but I fear the student has come to regard the unit as the real end instead of its being merely a symbol which represents a certain substance of knowledge. A number of colleges admit students from selected schools upon certificates declaring that the necessary number of units has been secured, proof of which is submitted in the form of a statement that the student has spent the required number of periods of proper length in the required study and has attained the required grade, thus confirming him in the belief that the certification of units is the end for which he has been working instead of knowledge and culture. If proof of knowledge and of mental training by means of examinations were required in every instance it would keep before the pupil the right ideal of attainment and necessarily improve the quality of his work. I do not wish to be understood as advocating the abandonment of so useful a device as the unit system. I am merely pleading for its proper employment and trying to drop a word of caution against a danger which I think I see in its application.

In conclusion, I wish to suggest that medical colleges be given a larger allowance of discretionary power in administering entrance requirements. The chief ends of education are mental training and the acquisition of an adequate mental equipment for the work to be undertaken and these things can not be measured by hard and fast rules. The applicant who has gone through a high school and has spent at least two years in college, but is short one or two units of biology, for example, may be better qualified than another who has attained the requisite number of units. His superior qualifications may depend upon the mental training acquired in other studies or upon a course in biology which, though shorter, may, nevertheless, better qualify him for grappling with the problems of medicine because of its more practical character. Until we have some way of knowing what a unit in biology means, the colleges should have the privilege of interpreting its value in individual cases. This is likewise true of other studies such as chemistry and physics, though in a lesser degree. While the teaching of these subjects is more accurately standardized and consequently the unit valuation more definite than that of biology, here, too, we should have some margin of discretionary power in evaluating the mental equipment and capacity of the applicant.

DISCUSSION

Dr. John T. Halsey, New Orleans, La.—Intending medical students, while well informed as to minimum or required preliminary education, have, in general, not been advised or instructed as to what type and scope of general education will best fit them not only for the study, but also for the practice of their profession. It is eminently desirable that this information and advice should be given while they are at high school or college. This could be done by the various councils and committees on medical education. Something could also be accomplished by the inclusion in the bulletins or catalogs of our medical schools of one or several paragraphs containing such advice.

Chancellor J. H. Kirkland, Vanderbilt University, Nashville, Tenn.—No one will venture to differ with Dr. Wilson in his claims for the necessity of extensive preparation for the study of medicine. No knowledge is too great, no attainments are too high for the future physician, but the discussion of such requirements as an academic question is one thing and the consideration of actual conditions is another.

I take it as established that the present requirements of the medical colleges will not soon be changed. Two years of college work is all that can be demanded; possibly it is all that should be required. At the same time it is well for some institutions of their own accord to require the completion of a four-year college course. These institutions represent ideal requirements and should be encouraged.

If we hold fast to the present requirement it is questionable whether much more can be done than we are now doing. Some improvements in work can be made. It would be of advantage if the pre-medical students could be put into special sections where their needs would be provided for, and where the contents of courses could be arranged more definitely to cover the best possible preparation for medicine. Medical colleges are under obligation to select their medical students from institutions giving special attention to the needs of pre-medical students. These students must not be taken at random from inferior colleges of all kinds with inferior courses.

Another suggestion is that a few institutions should introduce a three-year course as preparatory to the study of medicine. This three-year course could be made far superior to the present two-year college course, and if the institution desires to do so the degree of bachelor of science or even bachelor of arts might be given to the student after completing three years of college work and two years of medical work. Such an arrangement would provide better preparation for the study of medicine than the ordinary college course of four years.

Dr. Lewellys F. Barker, Baltimore, Md.—Dr. Wilson has set up an ideal toward which we may well work.

The education of the medical student before he enters the medical school should include preparation for life as well as preparation for medicine. Moreover, no student is prepared for medicine who is not also prepared for life; but there is an especial preparation for medicine that must be superimposed upon the general preparation for life.

There should not, in my opinion, be any increase in the minimal requirements for entrance to medicine at present, for the supply of medical students is too small now rather than too great. We should encourage more men to enter the medical profession.

Though the minimal requirement should not be increased, we should encourage young men of unusual ability to secure an educational equipment beyond the minimum. Men of superior ability will especially profit by such additional preparation.

What Dr. Wilson has said about the training of the emotions and the will as well as training of the intellect, seems to me particularly important at this time. For in medicine as much as in other walks of life, character is fully as important as intellect.

Dr. Tom A. Williams, Washington, D. C.—The consummation of Dr. Wilson's plan of medical education is devoutly to be wished when the ideal state which many of us have in mind is attained; but in the mean while, where are we to find doctors for the rural districts? Men trained in universities for so many years are disinclined to the kind of life the country doctor must lead. Indeed, too many of them too strongly desire to specialize and do so far too early in their medical life. Further, a taste seems to develop for administrative work if we are to believe the statement that of one famous school only 6 per cent of the graduates of the first ten years are now actually practicing medicine; and that of the graduates during the same period of a much older famous school only 2 per cent are in active practice. Of course men must be trained for teaching, research and administration, but not at the expense of the training of practitioners.

A modification of Dr. Wilson's plan seems, therefore, imperative for present needs. While agreeing that the humanities and other broadening subjects are highly desirable acquisitions for a practicing doctor and greatly add to the community good he can perform, and while agreeing that rural interests should not be neglected if modern civilization is to be maintained, yet the doctor's prime function in the eyes of the family is the care of the sick; and no matter how extensively penetrated by hygienic ideals we become, yet surgical and medical emergencies will always arise and chronic disease will always exist. Hence the practitioner must primarily be a technician. Too many, alas, are nothing more than this, but they are better than nothing at all.

I propose, therefore, that the high degree of cultivation aspired to in Dr. Wilson's scheme of education be postponed until after qualification in purely medical science and practice. In order to do this the plan would be somewhat as follows:

Although boys who are going to study medicine should have completed the present high school course at sixteen, we must deal with conditions as they are that the boys are not ready for college until seventeen or even eighteen. They should come there, however, with a preliminary knowledge of chemistry, physics, biology and at least one modern language. The college

course they pursue should be part of their medical course and not one of general culture; for one year is as much as should be spared for it. In that year should be studied the fundamentals of the aforesaid sciences, physics, chemistry and biology, including bacteriology, with particular reference to their application to the problems of human physiology, and the study of general morphology should include the introduction to human anatomy.

In the second year an intensive study of human anatomy, histology and physiology, including chemistry and pharmacology, should be begun, and this should continue through the third year, during which it should also comprise the anatomy and histology of morbid states and the study of the alteration of the physical signs these produce in the living body, including all special forms of instrumental inspection, the introduction to this being via surgical pathology. Toward the end of the year the highly complex physiology of the nervous system should be extended to include the kind of reactions we call psychological.

In the fourth year the application of these principles to the study of disease based upon general pathology should be begun and a sound knowledge gained of the data and principles of medicine, surgery and obstetrics; while in the fifth year the application of these principles the actual study of patients, more particularly in the dispensary, should be highly intensified, while at the same time an insight into neurology, and psychiatry should be insisted upon, as well as some acquaintance with the work comprised in such of the regional specialties as the eye, ear, nose, throat and pelvis. The application of the various facts to public health and to medical jurisprudence, comprising the elements of sociology, should also be insisted upon during this last year, at the end of which graduation is permissible. At least six months of hospital internship should then be obligatory.

A new factor is now introduced, viz., the obligation of every medical graduate to practice in the country for a minimum of three years. After this period he should be eligible to enter the post-graduate courses, included in which are the cultural studies proposed by Dr. Wilson as foundations of the medical course.

That is to say that the supply of doctors to the rural districts will be the first charge of the state. Such arrangement, however, would benefit not only the rural districts by bringing into them young active men with new ideas, but would benefit the doctor himself by placing him in a situation where he is forced to compensate for the present weaknesses of medical education as set forth in a previous communication (SOUTHERN MEDICAL JOURNAL, October, 1920). In the country he is obliged to rely upon his own resources rather than upon the laboratory and consultants. He is forced to follow difficult cases instead of immediately turning them into a hospital. Besides, his humanistic functions are appealed to in a way impossible when he is only a small cog in the large group of the hospital.

At the end of the probationary period of three years many men, having developed a taste for country life or having family ties, will elect to remain rural practitioners, a breed we can not afford to lose. To the others the opportunity of further development will be offered by the provision of residential appointments in hospitals or dispensaries in the large cities, where they will at the same time follow post-graduate courses in order to develop into consultants, and specialists if they are fitted and choose. These courses must include the broad perspective given by the study of human history, including languages and philosophy, with their modern extension into sociology and psychology. The period of study should be at least two years, at the end of which time maintenance should cease and a junior visiting hospital or dispensary appointment should be sought in conjunction with private practice or teaching as circumstances or tastes dictate.

Thus, a boy entering medical school at sixteen would be qualified for rural practice at twenty-one and a half. Having exercised and matured in three years of independence, he is at twenty-four and a half a man much more fitted to profit by the culture given by the large university; and even then he is only twenty-six and a half by the time he is a man of considerable perspective as well as technical proficiency for beginning practice in one of the more highly trained functions of the medical art.

Under the present method of primary education, however, one to two and a half years must be added to these ages, but even then we shall be no later than is the case in such a country as Norway, where eleven years is required for the medical course, and we shall have avoided the drawback of academizing our men by the expedient of the three years' rural practice, beside which the economic advantages to the individual are an important consideration. The gaining of the livelihood during these three years has a further advantage of a moral kind, viz., the promotion of independence of spirit and the avoidance of the habit of tutelage which prolonged academic life fosters.

THE VALUE OF THE LABORATORY TO MEDICAL TEACHING*

BY HENRY ENOS TULEY, M.D., F.A.C.P., Louisville, Ky.

Of what value is the clinical laboratory to the medical student?

When should the practical laboratory instruction be given?

How much time should be spent in study of the medical research laboratory problems by the student?

When should all of these be correlated?

These are problems which face the deans of all schools in an effort to correlate the laboratory with the practical in order to

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keep up the interest of the student, to graduate him with a broader view and insight into the chemistry of growth and function and to make of him a fairly finished product. He must be inspired with a desire to bring into use all modern diagnostic methods whenever indicated in the study of a patient.

I have frequently stated that the medical student is a peculiar entity, different, I think, from all other students. He usually has the attitude that "something is being put over on him." Our experience with the senior class of 1919-20 bears this out. Through the generous gift of a member of our faculty, the Department of Medicine was able to establish a medical research laboratory at the City Hospital, and the Board of Trustees was persuaded to appoint a salaried all-time professor of research medicine. The application of the newer methods of blood chemistry and basal metabolism as a routine on all patients in the hospital, in which they were indicated, was begun at once. The proper understanding of the laboratory methods, or the interpretation of the findings, was impossible by the members of the senior class, because the methods of Folin and others had not been taught them in their course in bio-chemistry. Arrangements were made at once for the Department of Chemistry to give the senior class a special course in bio-chemistry, including the practical laboratory work. A class meeting was held at once, a committee appointed to wait upon the Dean, etc., but wiser counsel prevailed, the course was taken, and before the end of the year students were running blood ureas, creatinin, non-protein nitrogen, etc., upon the cases assigned them in the various wards and were proud of their knowledge of the practical side of this work and its clinical importance.

The first two years in medicine are essentially laboratory years. In these two years we believe all of the essential laboratory and didactic work incident thereto should be given except in bio-chemistry and nutrition. Until the last session our laboratory course in clinical microscopy was given in the junior year, but this was found impracticable in view of the fact that when the junior student, in his work in the out-patient department of the Hospital, was called upon to do urinalyses, blood counts, fecal and sputum examinations, etc., he probably had not been over the special examination required in his laboratory course then going on. Now, when he has had his clinical microscopy course in his sophomore year, correlated with his physiological chemistry co-existent, he begins to apply these methods and tests on specimens from the patients he actually sees and from other departments while he is on laboratory service in his junior year. This practical work is further carried out during his senior year in his ward bedside work, as each student is held responsible for all necessary laboratory work on patients assigned to him in order to make a diagnosis.

It is our belief that the laboratory work of a teaching hospital should be thoroughly specialized and separated: pathology, bacteriology, serology, post-mortem technic, clinical microscopy and medical research. It is impossible for a student to do much in serology, unless he specializes, with an elective, to learn to do Wassermanns, or the technic of manufacture of vaccines, serums, etc. All we ask is that he understands the principle of these things. The detail, if he is interested, can later be mastered by a pathological interneship. The University of Louisville offers a degree of S.M. in bacteriology, physiology, etc., for a year's special work after graduation in the various laboratory specialties and the submission of a satisfactory thesis at the end of this time.

As for the research problems in medicine, I think we have not done our duty without making it possible for the senior student to be well grounded in the laboratory methods of blood chemistry and their practical application at the bedside. How many of our graduates of three years ago could tell what a Mosenthal diet test was, how it was carried out, and what could be learned by it; what the normal non-protein nitrogen or creatinin content of the blood was, in what patient this work should be done, or the significance of the

results, let alone tell how the tests were made?

The same can be said of certain diagnostic instruments of precision. One would not expect to have each student learn the method in detail of taking an electro-cardiograph or polygraphic tracing, nor would one hold each student responsible for correcting gases to temperature and barometric pressure which is required in metabolism. Nevertheless each student should be taught to interpret the more frequent electrocardiographic and polygraphic tracings and the significance of an increased or decreased basal metabolism.

The senior student may have learned something of basal metabolism in his course in physiology two years before and its mention perhaps awakens some faint memory. He should be taught this as a routine while doing his senior clinical work in medicine and know the significance of laboratory results. A practical, portable basal metabolism apparatus will be invented, so that eventually every graduate will have an instrument of this nature just as he has a sphygmanomometer and a stethoscope.

It may not be amiss to mention the change of attitude in regard to autopsies. Before the present wave of interest in chemical investigation spread over the country it was more or less of a fad for clinical men to be interested in post-mortem work. It should not be forgotten that the bedrock of medical investigation is in the post-mortem room. The more thoroughly a case is worked up on the wards before it comes to post-mortem, the more information can be gained by careful correlation between ante-mortem and post-mortem findings. Staff men should be requested and students and internes required to commit their clinical diagnoses on the chart and sign them. This stimulates more careful work and greater accuracy in diagnostic methods. In the ever broadening field of medicine the importance of post-mortem investigation should not be forgotten.

My plea is for an attractive presentation of all clinical and research laboratory problems to the end that the student may be so grounded in the technic as to cause him to look upon the performance of these routine examinations as an essential in diagnosis and prognosis. They can master these subjects without becoming highly trained specializing laboratory workers. To become the latter requires longer experience and training. We hope always that some of our students may become interested in these subjects and specialize in them to become laboratory assistants and teachers, for the field is indeed barren.

DISCUSSION

Dr. Lewellys F. Barker, Baltimore, Md.—If medical schools in general will adopt these suggestions of Dr. Tuley regarding higher training in the laboratory methods of clinical diagnosis we shall soon see a rapid increase in the competence of the practicing profession. Students trained as Dr. Tuley recommends during their first two years of work in the medical school will become valuable assistants to the hospital staff during the third and fourth years of their school work. Much of the routine laboratory work in the hospital wards can then be turned over with safety to the students, and the resident physicians and their assistants will be left free to do higher work. Moreover, the responsibility thrown upon the students by thus making them an actual part of the hospital staff during the period of their clinical clerkship is very stimulating to their development. A student who studies his cases carefully in the hospital ward by means of laboratory methods as well as by physical methods of exploration will become familiar with results that will make him unsatisfied in practice with less thorough methods of work. Furthermore, students habituated to the use of laboratory methods and to the use of instruments of precision will be better able in emergencies to form sound judgments without the use of these methods than are men who have never become familiar with them. Indeed, I sometimes think that one of the best effects of working with precise methods is to teach us to do pretty well without them when we have to. I hope that Dr. Tuley's paper will be widely read by medical educators and that it will have a beneficial influence upon medical curricula in all parts of the country.

GRADUATE MEDICAL EDUCATION IN THE SOUTH*

By James S. McLester, M.D.,
Birmingham, Ala.

When we contemplate graduate medical education in the South we are at once confronted by three questions: What is being done in this field today? Is there a need for such teaching? and, What should be its scope?

The first can be answered briefly. Practically all of the Southern medical schools offer some form of graduate instruction, permitting a limited number of graduates to follow the work of the senior class, to pursue special studies, or to engage in research. They offer, however, no definitely planned courses and their graduate study, which receives but scant encouragement, is a mere by-product of the undergraduate work. Of schools organized solely for graduate instruction, the South possesses but two: the Graduate Department of Tulane University and the Graduate School of Medicine of the University of Alabama.

Separate schools for the instruction of these two classes of students is a necessity. The Council on Medical Education of the American Medical Association has expressed the opinion that for greater efficiency, graduate and undergraduate schools should have separate and distinct faculties and that only in exceptional cases should a teacher be permitted to serve upon both. When we consider the divergent needs of the two and when we remember the exacting demands of all teaching, the wisdom of this advice is evident.

Concerning the second question as to the need for such teaching in the South, there can be but one answer. Certain factors have conspired to make our needs especially urgent. Chief among these is the poverty which was imposed upon the South by the Civil War at a time when most of the medical schools were being organized. This was reflected in the meager equipment of Southern schools, and as a consequence our graduates of the past twenty-five years were deprived of the benefit of the well-appointed laboratories, the larger libraries and the better trained faculties enjoyed by the students of other sections. These Southern physicians, no matter how high their talents and efforts may carry them in after life, will never cease to feel the disadvantages of defective early training. It was to enable the Southern physician to cope with such early disadvantages that the graduate medical school was organized.

Another handicap to the Southern physician is his isolation. It is not difficult for the medical man to keep abreast of the times when he is constantly stimulated by the infectious enthusiasm of those around him, but it is very different when he is seldom in contact with his colleagues and when the hard demands of each day leave him at night thoroughly exhausted and without other ambition than to go to bed. Small wonder that such a man finally "runs down" and like the storage battery, must go away for a recharge. The graduate school will be of service not only in teaching this man the newer things of medicine and surgery, but it will stimulate him to renewed enthusiasm for his profession and will finally bring to him a broader vision.

Coming to the third question, the aim and scope of the graduate medical schools of the South could be discussed at great length, but I shall speak only of that phase of teaching which from my own viewpoint seems most suited to our peculiar needs. May I, as illustrating my views of the kind of work most needed, confine myself to a narration of our plans for developing the school in Alabama?

Organization of this school as a department of the University of Alabama was in progress when the World War began and of necessity all teaching soon ceased. Reorganization is now under way. Our immediate aim will be threefold: (1) to refresh and broaden the man in practice and to help him to renewed interest in his work; (2) to train a limited number of men in the rudiments of public health and fit them to fill positions as county and municipal health officer; and (3) to offer properly trained men opportunities for research in the clinic and laboratory. No

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attempt will be made to train specialists. That may come in the future. For the present, we shall content ourselves with an effort to elevate and broaden the plane of medical practice.

In pursuance of these plans we shall offer four courses: (a) in medicine; (b) in surgery; (c) in public health, and (d) a special course in laboratory technic. Each course will be well rounded, including always a certain amount of laboratory work. In addition to these, provision will be made for coaching the physician or surgeon in some particular field in which he feels himself deficient, but this will be in the direction of broadening his general education rather than toward making him a finished specialist. We shall ask the physician who matriculates to choose one of these courses and to complete all of the prescribed work. This, we hope, will keep him busy the entire day.

The medical course will consist largely of bedside work in the wards with a certain number of clinical lectures. It will include such allied branches as pediatrics, neurology, and dermatology. Similarly the course in surgery will be practical and will include gynecology, genito-urinary surgery, and orthopedic surgery. Obstetrics will be an elective. An effort will be made to include in each of the courses such instruction in diseases of the eye, ear, nose and throat as will be useful to the general practitioner.

The teaching in public health will include laboratory work in bacteriology and immunology, and lectures upon epidemiology and social service.

We recognize that in following such a plan we are trying to cover a broad field and that we shall for this reason be in danger of doing superficial work. In answer to this criticism we would reply that our effort is not to cover in a complete manner the entire field of medicine, but, instead, to give the general practitioner the newer things of today, and above all, to teach him method. If we can inculcate in him thoroughness of method and interest in his work and stimulate him to the enjoyment of current medical literature, we shall have achieved genuine success.

Each class will be small enough for personal instruction. The busy practitioner will not feel that he can come if the courses are too long, and for this reason we shall at present offer courses of six weeks, dividing each in half so that a physician, if need be, can take the half course at one time and complete it the following year.

The hospital affords an abundance of clinical material and this will be used in conjunction with the laboratory for research by properly prepared students. We should like to offer such research workers every opportunity within our means.

The questions of certificates and of tuition are difficult ones to answer. We should like to discourage any one who comes with the object of securing a certificate which he can frame and hang in his office, and one questions whether in the beginning certificates of any kind should be offered. On the other hand, some recognition of work actually done should be given and it has been decided that a simple statement of fact will be given each physician who completes a regular course or who does creditable work in any special field.

Tuition should in the beginning be nominal and no effort should be made to increase materially the budget by means of fees received from the students.

SUMMARY

There is a genuine need for graduate medical education in the South. The courses must be short, well rounded and general. The effort should be made to inculcate method rather than to teach a mass of facts.

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POST-GRADUATE TEACHING IN THE SOUTH, WITH ESPECIAL REFERENCE TO CONDITIONS AT TULANE UNIVERSITY*

By Allan Eustis, B.S., Ph.B., M.D.,
New Orleans, La.

Until recent years the legal requirements for the practice of medicine throughout the Southern states were far less rigid than in the Northern states, with the result that the vast majority of physicians graduating in the South up to fifteen or

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twenty years ago started in practice with a scant knowledge of physiology, bacteriology and pathology, and without any knowledge of biological chemistry. Some, by hard work and reading, with post-graduate courses have kept up with the progress of medicine and its allied sciences, but as a general rule the older rural physicians are practicing medicine today as it was taught twenty years ago. The advent of the recent graduate with his thorough preliminary and hospital training has forced many of these older members of the profession to seek post-graduate work; and today there is a greater demand in the South for graduate instruction than ever before. The annual meetings of the Southern Medical Association in widely separated states has, no doubt also been an important factor in bringing about this change.

During my eight years of post-graduate teaching there has been a noticeable change in the type of individual matriculant and in his attitude towards his work. Formerly, it appeared that the average student was attending the school as a rest cure, and any allusion to pathology or physiology in a lecture was certain of producing a hypnotic effect upon the class, while, whenever treatment was taken up, especially if a prescription were written on the blackboard, there was a hurried rustle of note books. Today, I am happy to say, the average student is thoroughly imbued with the necessity of a full knowledge of pathology before any diagnosis can be made, and likewise of physiology before any rational treatment can be outlined.

I might add that one of the most popular courses is clinical microscopy, while Professor Harris' lectures on gross pathology are always well attended and fully appreciated, if I am to judge by the statements made to me by the men attending them.

Anticipating that the previous reader, Dr. McLester, will in his usual thorough manner present the paucity of graduate instruction in medicine obtainable in the South, as well as practical and wholesome suggestions for bettering conditions, and following the suggestion of our Chairman, I shall attempt simply to give a concise idea of the post-graduate courses given at Tulane, which are unique in a way, but which seem to meet admirably the demands of the matriculants.

The Graduate School of Medicine of Tulane University, formerly the New Orleans Polyclinic, has been in existence since 1888, during which time it has changed and broadened its policies from year to year to meet the growing demands of post-graduate medical instruction. Formerly, one single schedule was maintained and all students attended the same lectures. It was found that many men were not at all interested in medicine, but wished instruction in surgery, or special senses, or intensive training in clinical microscopy, so that today we have four main schedules or courses, all costing the student a like amount, entrance to any of which is open to students of any other course without any additional cost.

These courses are medical, surgical, special senses and clinical microscopy, and our aim is to occupy the entire time of the student during a period of six or more weeks, during which time he is at liberty to choose any special lectures, such as fractures, dislocations, etc., even though he may be attending in the main the medical lectures. The several courses covered in these four main schedules are: (1) diseases of the eye; (2) genito-urinary and rectal diseases; (3) obstetrics and gynecology; (4) practice of medicine; (5) general and abdominal surgery; (6) diseases of the digestive system; (7) operative and clinical surgery; (8) gynecology and obstetrics; (9) orthopedics and surgical diseases of children; (10) surgery of the genito-urinary organs and rectum; (11) diseases of the skin; (12) clinical surgery; (13) diseases of the ear, nose and throat; (14) clinical therapeutics; (15) internal medicine; (16) clinical laboratory diagnosis; (17) dietetics and nutritional diseases; (18) operative gynecology on the cadaver; (19) diseases of the nervous system; (20) radiology; (21) phthisiology; (22) genito-urinary diseases and cystoscopy; (23) pathology; (24) abdominal surgery; (25) medical diagnosis; (26) physical diagnosis; (27) diseases of children; (28) clinical anesthesia; (29) tropical medicine; and (30) life insurance examinations.

We have found that the average student applying at the Dean's office has no concise idea of what he wishes, but realizes that he needs instruction in all branches of medicine. Often students attend the medical or surgical courses for four or six weeks and then attend clinical microscopy or return the following year for the latter. For those who wish more intensive training in some special line such as roentgenology, cystoscopy, refraction, serology, etc., arrangements are made through the Dean's office. During the past session we had 317 matriculants, of whom 200 remained for four weeks; over sixty for six weeks, and the balance from two to nine months. We have noted that the number remaining from six months to a year for intense training in special branches is on the increase annually; and realizing that such intense work is to be encouraged, the faculty of the Graduate School of Medicine of Tulane University has recommended to the Board of Administrators of the University that the degree of Doctor of Science in Ophthalmology, Otolaryngology, Radiology, or the particular specialty in which the requisite work has been done, shall be conferred.

We believe that this arrangement better meets the needs of the average Southern post-graduate student than a large number of special courses with separate fees, as obtains in most post-graduate schools. The faculty of the school consists of two emeritus professors, thirty professors, nine assistant professors and twenty-seven lecturers and clinical assistants, elected by the Board of Administrators of the University on recommendation of the faculty.

The clinical lectures in surgery and medicine are held in the forenoon in the Charity Hospital with over eleven hundred beds, annually occupied by from nine to ten thousand patients, with about thirty thousand outdoor patients annually. This vast clinical material is shared with the undergraduate School of Medicine of Tulane and with the Post-Graduate School of Loyola University. All laboratory courses and didactic lectures are held in the Hutchinson Memorial Building, only two blocks from the Charity Hospital, so that little time is lost in coming and going to lectures.

The courses in eye, ear, nose and throat are given in the New Orleans Eye, Ear, Nose and Throat Hospital and are almost entirely clinical and practical. This hospital with an enrollment of about eight thousand individual patients, two thousand operations and nearly forty thousand consultations annually, is only two blocks from the Charity Hospital and five blocks from the Hutchinson Memorial. Our professors of diseases of the eye and of diseases of the ear, nose and throat are the surgeons in charge of these respective departments of the hospital and instruction in this institution is limited to matriculants of Tulane. The Hospital is completely equipped with special apparatus and a thoroughly equipped x-ray, as well as pathological laboratories.

The course in clinical microscopy, entirely practical, occupies the members from 11 a. m. to 4:30 p. m. with one hour recess at 1 p. m., and allows of the participation in clinical and didactic lectures before and after these hours. Each student must furnish his own microscope, which may be rented from outside firms, but the students are urged to purchase them, for if an individual buys a microscope while attending lectures he is more liable to use one when he returns home and resumes his practice.

In my own branch of dietetics and nutritional diseases a course of twelve didactic lectures is given with demonstrations of such chemical procedures as are necessary for a diagnosis and the subject is approached from a clinical side rather than from a purely dietetic aspect. The dietetic management of such diseases as nephritis, diabetes, typhoid fever and others in which the diet is the main factor is taken up after a consideration of the pathology of the disease and a consideration of the physiology of the particular organ involved. In my clinical lectures the student is brought in direct contact with the patient in the outdoor clinic of the Charity Hospital and the effect of diet demonstrated, while he is given an opportunity to collect secretions and excretions and examine them himself in the afternoon in the laboratory of clinical micro-

scopy under the direction of Professors Bass and Cole. This close co-operation of the clinical and laboratory teaching is of inestimable value to the student and has been a great factor in stimulating ambition in the latter. Unfortunately when classes are large, this personal supervision is impossible, and I feel that the time is not far distant when clinical classes will be divided into sections of not more than six students.

Co-operation with the department of roentgenology has also been a means of stimulating interest among the students, and, in addition to increasing interest in my branch, has often served to impress upon a student the importance of the x-ray in diagnosis. Clinico-pathological conferences after death of a patient is much to be desired, but unfortunately this has not been developed to the extent that it should, but whenever a patient whom the students have seen is transferred to the surgical division for operation, the latter are urged to be present at the operation and to profit by our mistakes in diagnosis.

In closing, it might be said that the best results in post-graduate teaching, whether in the North, South, East or West, can be obtained only by close co-operation and team work on the part of the faculty, by devotion to duty and zeal in teaching on the part of each and every member of the faculty, and a desire to impart his knowledge to the student rather than to display his own ability as a surgeon or diagnostician.

DISCUSSION

Papers of Dr. McLester and Dr. Eustis.

Dr. E. H. Cary, Dallas, Tex.—Post-graduate medical study is the next big thing to be developed in the interest of the sick. One of the evils of the past has been the lack of responsibility on the part of the post-graduate schools in the matter of their students, allowing them to plan their own courses of instruction, and to determine for themselves their fitness to practice a specialty. Post-graduate schools, as such, have apparently only had a monetary interest in the students who matriculate with them; but to deny that these schools have rendered service would be a mistake, for at any rate they have fostered the idea that further work is possible and advisable for the man who year after year goes on in much the same line of practice. The terrible blunder from the standpoint of the sick lies in the fact that the untrained medical men went to a school which did not assume any responsibility as to their fitness when they left, backed by a certificate from the school, to practice a specialty, allowing them to learn through many years of practice with mistakes in taking care of their patients the things they ought to know before they assume the title and practice of a specialist.

The present idea is to place post-graduate teaching on a sound basis with a university responsible for the conduct of the work, and my own opinion is that it can not be done in a school organized primarily for undergraduate work. There is no reason why a great university could not be responsible for both if money is plentiful and the clinical field large enough. And while it would be commendable to develop such institutions in our largest cities in the South, we should withhold our support from any institution not favorably placed both as to funds and clinical material, for under unfavorable conditions the new plan would fall into all the mistakes of the old. There is, however, a chance to develop post-graduate work through the county medical societies, utilizing those who are on medical college faculties to give clinical meetings, bringing to the door of all improved methods and an inspiration to better things, a cultivation of a desire on the part of a larger number of doctors to take more work in a properly organized university.

We have had too many so-called specialists, illy-prepared, forced on the people. Let us bend our energies to make, first, better practitioners, then stimulate them to devote the time and attention absolutely necessary for good post-graduate work in a properly organized univerity; next give them that recognition due their worth and attainments.

Dr. Stewart R. Roberts, Atlanta, Ga.—These two papers by Drs. McLester and Eustis are important in showing the advance in graduate medical education in the South. New Orleans has long led other Southern cities in this particular field. The opening of the Graduate School of Medicine at Birmingham as a school of the State University is well known. It is probably true that graduate medical education has hardly begun in this country. Certainly it has not nearly reached its organization as illustrated by the Vienna or London schools. At the same time we are on the way to progress. Harvard has done much with her graduate school. New York, Chicago, Cleveland and the Barnes Hospital at St. Louis are all leaders. Philadelphia and Baltimore have done much. The influence of Osler, Welch, Kelly and Halsted will be felt in the graduate schools for many years.

The Mayo Clinic is an increasing Mecca for medical men, particularly surgeons. It is doubtful if the average surgeon who goes to the Mayo Clinic receives the full benefit of his trip. He goes to the surgical hospitals, sees the surgical operations, their thoroughness and number. He is apt to skip the clinic building, where the real examination, study and diagnosis of the patient is done. When the patient reaches the surgeon the preliminary work has all been done, as it should have been. This is the great graduate lesson to the medical man as well as to the surgeon.

Graduate courses in this country are too often short six weeks' trips, taken to promote the doc-

tor from general practice to a specialty. Their ultimate aim is greater ease and income and the ability of the specialist on his return is sometimes proportionate to the brevity of his course. It takes a long time to make a specialist. On the other hand, nothing is so refreshing, so uplifting, so reacting to good to patients and physicians as a four to twelve weeks' graduate course taken with the granite experience of post-medical practice, and the fortunate son of Hippocrates who can force himself from income to greater knowledge is the real hope and man of his profession and will be of the efficient order of his generation.

Finally, it takes great finances to develop great graduate schools. The future will probably develop such an institution in the East, one in the Middle West, and one in the South. They are necessary. Compare the man who makes excuses to get away to medical societies and graduate courses, and goes often, with the man who makes excuses not to get away, and who has sawed in isolation medical wood of his own growth for twenty years. The former is a torch of his medical generation and the latter already belongs to a former generation. Our course that gave us our degree is but an introduction to the study of our profession and the practice of our art.

Dr. Lewellys F. Barker, Baltimore, Md.—I agree with Dr. McLester that the South needs post-graduate opportunities, that these opportunities should be wide in scope, that the university medical schools should do what they can to provide such opportunities, and also that hospitals not connected with medical schools could well serve an important function by developing well-organized courses for graduates. Hitherto our interest in this country in post-graduate instruction has been too desultory. The courses have been inadequately planned; physicians have been left in ignorance as to where such courses could be obtained; and vast amounts of material suitable for post-graduate instruction have remained unutilized.

The development of post-graduate instruction in hospitals in which no teaching is now done would rapidly improve the character of the work done in those hospitals. For teaching compels study on the part of the teachers, and enforced study leads to the more rapid acquisition of new ideas with the result that the practical activities of the hospital keep pace better with the progress of medical knowledge and technic.

There need be no fear that the patients will object to post-graduate teaching in the hospitals. On the contrary, it has been my experience that patients on whom clinics are held are appreciative of the additional attention given to them. They feel that they are being given unusual consideration from which they will profit.

Provision should be made for at least two kinds of post-graduate instruction: (1) the higher kind, which will permit a physician to spend one or two years or longer in special work in a limited field; and (2) briefer continuation courses in which practicing physicians may improve their general knowledge and technic. The former kind of post-graduate instruction will be most successfully carried on in the university medical schools and hospitals. The latter kind can well be performed by hospitals that are unconnected with medical schools or that are perhaps loosely associated with the medical school and university.

The organization of post-graduate faculties separate from the under-graduate faculties in medical schools is highly desirable for the reasons Dr. McLester has emphasized.

It is gratifying to hear of the liberal efforts made in the direction of graduate instruction at Tulane University. The appreciation of these efforts will doubtless grow as they gradually become better known to physicians in Louisiana and in neighboring states. And as ever more graduates turn to New Orleans for continuation studies and for research, the prestige of New Orleans as a medical center is bound to grow. What New Orleans is doing several other cities in the South can also do. It is to be hoped that the leaders of medical thought and opinion in these cities will speedily become conscious of their opportunities and duties as regards post-graduate teaching. If they will do so they will contribute materially to that rapid advance of medicine in the South that is now being made and of which we all feel proud.

Dr. McLester (closing).—I have been very much interested to note how nearly our ideals in Birmingham coincide with those of New Orleans as expressed by Dr. Eustis. It seems that the aims of the two schools are very similar.

Concerning the comment to the effect that we should be very careful in our efforts toward training surgeons, our work in surgery is largely in the field of surgical diagnosis. Again I should like to emphasize the fact that we do not propose to train specialists.

Dr. Eustis (closing).—I can not agree that surgical teaching should be dispensed with in graduate schools simply because one sees a lot of bad surgery performed by men in rural districts. Rather is this an argument in favor of such teaching, but I sincerely believe that the present methods pursued in this branch in most schools is open to severe criticism. Too often the surgeon is more occupied in demonstrating to the class his own particular skill with the hope of subsequent reference work than in imparting his knowledge to the student body. We lay a great deal of stress on cadaveric surgery and I know from actual observation that the surgical technic of many of our students has been greatly improved by it. I am opposed to issuing any certificates of simple attendance, and believe that if certificates of proficiency, after a proper attendance and practical examination, were given there would be a great improvement in the work of our schools. In regard to mixing graduates and under-graduates, we have not found such a plan practical. However, I believe that the growing demand for post-graduate instruction in the primary branches can best be supplied by under-graduate faculties.

In closing, I wish again to state that the type of man who comes to us now is eager for work and ambitious to learn, and, if they are not wonderfully improved by their attendance, something is radically wrong in the teaching.

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EDITORIAL DEPARTMENT

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Reduced railroad rates on Identification Certificate plan. Write to Association office, Birmingham, Alabama, for a Certificate if you are going to Hot Springs.

THE CHIROPRACTORS

It is astonishing what crimes men will commit for money. As an exemplification of this statement it is only necessary to point to the chiropractors, who without any knowledge of anatomy, physiology, pathology and the underlying causes of disease assume the responsibility for the lives of afflicted human beings.

The gullibility of the public is as remarkable as the ignorance and the rascality of the chiropractors. A proof of this is the fact that the clientele of the quacks known as chiropractors come not only from the ignorant but from lawyers, ministers, teachers and other educated people, who should have sense enough to know that a man cannot get any more than the "little knowledge" which "is a dangerous thing" in the few weeks course that chiropractors take before taking up the vocation of treating the sick. It is surely strange that people who have been given minds to think for themselves would trust their lives in the hands of, and give their hard earned money to, chiropractors without investigating their character and preparation for curing disease. P. T. Barnum evidently understood "applied" psychology when he gave to the world homely aphorisms, i. e., "A fool is born every minute," and "Men love to be humbugged."

If one would take the trouble to investigate the previous occupations and general standing of the chiropractors one would find that their ranks have been recruited from barbers, laborers, and ne'er do wells of every class, including a few doctors, who have fallen victims to the alluring advertisements of chiropractic "colleges" whose promoters propose to teach men in a few weeks how to earn a hundred dollars a day. Why be a barber at ten dollars a day when one may become a chiropractor in three weeks and extract five hundred a week from the pockets of the gullible public?

THE MEDICAL PROFESSION AND THE CHIROPRACTORS

That the chiropractors are a menace to the health and lives of a community is well known to physicians who see the end results of these fakers' treatment of the sick. Physicians often see patients who have appendicitis, who have been manipulated by chiropractors who did not suspect the nature of the condition they were treating until it was too late for their lives to be saved by a simple operation. Cases of typhoid fever have been treated by these charlatans until hemorrhages and perforations of the intestines would force distressed relatives to call in medical aid. The last dollars of tuberculous patients, and their hope to live have been sacrificed to the greed and ignorance of the chiropractors. These conscienceless pretenders propose to cure diabetes without dieting; and syphilis and gonorrhea without medicines.

Physicians know that these and many other crimes can be proven; yet the chiropractic ranks are increasing and they have grown strong enough in many states to pass legislation recognizing the chiropractic "profession"—"God save the mark!" It is said that in Georgia the chiropractors have increased from 12 to 148 in two years; and they have been able to have a bill passed through the Georgia House of Representatives—and there seems little doubt about its becoming a law—providing for an examining board of chiropractors to pass upon the qualifications of ambitious barbers and others who desire to prey upon the credulity of the Georgia public.

The chiropractors have succeeded in getting a considerable proportion of the public to believe that the medical profession opposes their practicing because they "take dollars out of the doctors' pockets." Nothing could be further from the truth. It is a fact that chiropractors do take patients from doctors temporarily, but they usually come back in worse condition than before they left. They, therefore, require longer treatment and in the long run doctors actually profit by the presence of these parasites in any community. It is because physicians know of the mistakes of chiropractors and the actual injury they often do to sick people, that they are willing to at least make the effort to protect the public against their practice.

Physicians have saved hundreds of thousands of lives by informing the public of the facts regarding tuberculosis, typhoid fever and other communicable diseases that are a menace to any community. They have also protected the public by fixing standards for the practice of medicine and by getting laws passed preventing physicians and others from practicing medicine illegally. If the medical profession is not willing to give a little time and money to prosecuting chiropractors who are practicing illegally it will not be done. The chiropractors are spending vast sums advertising in newspapers and in sending solicitors into the homes to "sell" their "rotten goods;" and at the same time they are making every effort to discredit the medical profession, because their guilty consciences tell them that physicians know they are frauds.

In many states the boards of health, recognizing that the chiropractors are dangerous enemies to the public because they do not report communicable diseases, and because they are treating syphilitics, etc., who can spread disease without any effort to protect others, are making strenuous efforts to stop them from their nefarious practice. In some communities physicians are aiding the health authorities in their worthy efforts to protect the public from the evils of chiropractic charlatanism. It manifestly is as much the duty of physicians to aid the legal authorities in the prosecution of chiropractors who are violating the laws, as it is to give the courts the facts about physicians who are practicing medicine without licenses. The medical profession will not fail in this duty to the public; but physicians should awake to the growth in numbers and in influence of the chiropractors.

MEDICAL EXAMINING BOARDS

The successful efforts of the homeopaths, the osteopaths, the chiropractors and other healing cults to establish separate boards of examiners in many states make it appear timely to discuss measures to prevent the recognition of any particular class of persons who are to be given the privilege of treating the sick. In some states there are four or five boards of examiners to pass upon the qualifications of those who are to be intrusted with the responsibility of caring for the sick. Thus

there are boards composed of "regulars," homeopaths, eclectics, osteopaths, optometrists and chiropractors.

The argument used by the various cults in having their boards established is that "regular" physicians are not competent to pass upon the qualifications of homeopaths, osteopaths and chiropractors and that they will not allow any one who is not of their school to be licensed to practice. They also claim that it is class legislation to give the "regulars" the authority to prevent men of other schools from treating the sick. This fallacious argument added to the fact that the chiropractors and others have well paid legislators and lobbyists to put through their bills has succeeded in the creation of multiple boards of examiners in many states.

The legislators, in many instances, have not been informed of the fact that the so-called "regulars" do not practice any form of medicine to the exclusion of others, and that they are always ready and willing to investigate any method of curing the sick and alleviating suffering with the purpose to adopt as a part of their armamentarium any measures that have been proved meritorious in treating and preventing disease. The "regular" medical profession has long ago investigated all the claims of homeopathy, osteopathy, the Christian science and other cults with an open mind to find if there is a modicum of good in them.

The "Similia similibus curentur" of Hahneman was investigated by the regulars and found to be the delusion of a disordered brain; but the small dosage of drugs as practiced by the homeopaths has in some instances been adopted by the so-called allopaths. Likewise osteopathy has had its effect upon the practice of medicine as is manifested by the training of professional masseurs who treat patients under the direction of physicians; while Christian science has had its influence in making regular physicians realize the value of psychotherapy.

Chiropractic methods have also been investigated by physicians. They have been found to be a shoddy imitation of those used by the osteopaths without the redeeming physiotherapy employed by the latter. There is absolutely no excuse for the existence of the chiropractors. It is merely a new name for an old method of separating the hopeful, but unwary neurasthenic from his money.

LAWYERS PROTECT THE PUBLIC AGAINST LEGAL CHARLATANS

Lawyers have succeeded to a very great extent in protecting the public from the shysters who through ignorance or chicanery prey upon the credulity of the public. Before a man can practice law legally he must be examined by a board of regular lawyers, usually the supreme court of a state. Likewise if a lawyer is debarred it is done by a board usually appointed by the state bar association. There is only one board of lawyers in each state to examine those who desire to practice law to determine their fitness to become members of the legal profession; and likewise there should be only one examining board of physicians to pass upon the qualifications of those who would practice the art of healing the sick.

Most of the states have only one board of medical examiners, but in some there exist multiple boards for the examination of those who desire to practice the so-called different systems of medicine. The Alabama plan, the product of the master mind of one of the greatest medical organizers in history, Dr. Jerome Cochrane, of Mobile, has stood the test of more than half a century. Dr. Cochrane said that there could be no objection to licensing the homeopaths or eclectics, or the graduates of any other school of medicine provided they have a working knowledge of the

anatomy and physiology of the human body; and the pathology, bacteriology, and the symptomatology of disease. Therefore the applicant to practice medicine in Alabama has to pass examinations on all subjects taught in medical schools except materia medica and therapeutics. The laws in Alabama manifestly are not intended to exclude the graduates of any particular school from practicing medicine and the system has withstood the assaults of the cults who have appealed to the state legislature at different times for separate boards, using the old argument that the "regulars" are not competent to pass upon the qualifications of homeopaths, osteopaths, et cetera.

The medical profession in the states which have multiple boards should take the time and trouble to secure the passage of laws that would protect the public from incompetent practitioners whether from the "regular" or any other school that proposes to teach the art of healing the sick. It is admittedly better to require applicants to be examined upon materia medica, as upon all the other subjects taught in a class A medical school; but in the states that have multiple boards the Alabama plan would appeal to legislators as being absolutely fair to all who would practice the healing art. With few exceptions legislators are honest men who desire to enact just legislation, and if they create multiple boards of medical examiners it is because the homeopaths, the osteopaths and the chiropractors have been more active in presenting their claims than regular physicians have been in placing the facts before those whose duty it is to make laws. Physicians should follow the example of the lawyers in securing legislation to protect the public from the practices of charlatans.

NORTH CAROLINA'S EFFORTS TO ERADICATE MALARIA

North Carolina, under the direction of that great sanitarian, Dr. W. S. Rankin, has one of the most efficient departments of health in these United States. Public health work in that State has attracted much attention from health officials in many other states. North Carolina was one of the first of the Southern states to be listed in the "registration area" of the United States Census, and in many other public health activities it has excelled. Much attention has been directed toward North Carolina recently on account of the really remarkable results that have been accomplished in anti-malaria work in a number of towns and counties in that State. If these efforts are continued, North Carolina will have the credit of being one of the first states, if not the first state, in the South to eradicate malaria.

Malaria control work in North Carolina had its start many years ago when, through the efforts of Dr. H. R. Carter, Dr. R. H. von Ezdorf and Dr. T. H. D. Griffitts, in co-operation with Dr. W. S. Rankin, many of the towns of eastern North Carolina were surveyed and public lectures given on malaria. Since that time malaria control work has been successfully carried out in a number of towns and cities, among them being Roanoke Rapids, Wilmington, Fayetteville, Goldsboro, Greenville, Farmville, Smithfield and Grainger. In most instances the work was started by the towns with the co-operation of the United States Public Health Service, the State Board of Health and the International Health Board. A number of these places have continued the work themselves as a part of the regular municipal program.

ANTI-MALARIA METHODS IN NORTH CAROLINA

Although not precisely the same in each town or city, the work has concerned itself chiefly with the eradication of the mosquito through the destruction or treatment of his breeding place.

The malaria control work as carried out in North Carolina consists of:

1. The construction of such new drainage ditches and channels as may be necessary.
2. Cleaning and regrading of existing ditches and streams.
3. Stocking with fish of such waters as are found to be too expensive to drain. (For this purpose they use the top minnow known as Gambusia affinis. This tiny fish is a natural enemy of the mosquito larvae or "wiggle tails" and will destroy them in great numbers. If the surface of the water is kept free from trash and plant life and the banks kept clean, almost perfect control of mosquito breeding can be effected through the use of this fish. The use of Gambusia in artificial containers such as wells and fountains has proven very satisfactory.)
4. Oiling the surface of standing water and sluggish streams. (Here again the water surface must be cleared and the banks kept clean. The oil used is kerosene with some crude or black oil. The oil is sprayed onto the surface of the water with a Myers knapsack sprayer or allowed to drip from drip cans, where it spreads out and forms a film which prevents the "wiggle tails" or mosquito pupae, as the case may be, from reaching the surface for air. The tiny breathing tubes of the "wiggle tails" and pupae can not pierce the oil film and as a result they are drowned. It has been found advisable to use a high percentage of kerosene with just enough black oil to thoroughly color it, on account of the much greater toxic effect of kerosene as compared to black or crude oil.)
5. House-to-house inspections to find artificial water containers such as tin cans, flower pots, wash tubs, stopped-up gutters, unused wells, etc.

RESULTS AND COSTS

The success of anti-malaria efforts in North Carolina is evident from the table below, which shows an average reduction of 86 per cent in malaria in 1920 as compared to 1919. In as much as 1920 was the first year in which work was done in these towns, we can reasonably expect a still further reduction in 1921.

Cases of malaria as reported by doctors in Farmville, Greenville and Goldsboro, N. C., for the years 1919 and 1920:

	1919	1920	Per Ct Reduct'n
Farmville	190	21	89
Greenville	543	81	85.1
Goldsboro	643	91	86

The following is a brief summary of the total costs at Farmville, Greenville and Goldsboro, N. C.:

	Pop.	Total Costs
Farmville	2,100	$ 4,980.40
Greenville	5,700	8,972.98
Goldsboro	11,300	10,052.19
Totals	19,100	$24,005.57

Below is given the average cost per mile of the various types of work enumerated in the above summary:

COST PER MILE

	New Ditches	Streams Cleared	Dist. Oiled	Maintenance
Farmville	426.00	159.00	5.01	68.00
Greenville	740.00	289.00	8.88	58.70
Goldsboro	304.00	278.00	6.40	49.00
Av. for 3 towns	$490.00	$242.00	$6.76	$58.56

EDUCATIONAL CAMPAIGNS

This year in North Carolina, in addition to the malaria control demonstrations such as have just been described, a county-wide malaria program is being carried on with the idea of reaching those people who reside in purely rural districts where intensive malaria drainage work would prove too expensive.

The campaign is largely educational, consisting of personal visits to the rural districts for the purpose of talking and demonstrating the various ways of fighting malaria such as screening, quinin prophylaxis, the linking up of farm drainage and malaria drainage, and the use of fish and oil in controlling mosquito breeding. In this rural work the malaria problem is regarded as an individual one and each farmer is visited personally with the idea of helping him to solve his own particular mosquito trouble. The interest and cooperation shown by those visited is very gratifying. It is hoped and believed that this county-wide malaria work will prove even more successful and widespread in

its results than the more intensive drainage work done in the urban communities.

Details of the anti-malaria work in North Carolina have been given space in the editorial columns of the SOUTHERN MEDICAL JOURNAL to inform the physicians of other states what can be done to prevent malaria at a cost which is trivial when compared to the saving in human lives and the promoting of efficiency in the localities affected. Physicians in communities in which malaria is endemic should aid the health authorities in their counties and states in carrying on the work to eradicate the greatest enemy to the industrial and agricultural development of the South.

ROENTGEN RAY IN CHRONIC TONSILLITIS

Attention to the effect of the x-ray upon lymphoid tissue was first called by the German, Heinike, (1905) who demonstrated that exposure to radiation for a short time causes destruction of the lymphogenic tissues of the body, and a corresponding decrease in the circulating lymphocytes.

In mice who have been exposed to the x-ray five minutes daily for a period of ten days Murphy[1] showed that transplantations of heteroplastic tissue are successful, though they are unsuccessful in normal mice. He inoculated with Ehrlich sarcoma mice which had been radiated, and from the growth after fourteen or more days he was able to inoculate several generations of mice. In unexposed mice the sarcoma disappears after approximately nine days. He concluded from this that the destruction of the natural immunity to sarcoma was probably due to the destruction of the lymphoid tissue.

Further work was done along this same line by Murphy and Morton,[2] and Taylor and Morton,[3] which showed that resistance to both cancer and tuberculosis is attended by an increase in the number of circulating lymphocytes, and that the resistance and lymphocytosis may both be destroyed by x-rays in proper dosage. It was also shown that x-rays in large doses affect the lymphocytes before any of the other circulating cells.[4] With the recent rapid improvements in x-ray tubes, a higher voltage and a more accurate dosage is available than has been in past experiments. The work of different investigators is more readily comparable, and it has been shown that though a fairly large dose destroys, a small dose stimulates, the lymphocytes.[5] If we expose rabbits to a $\frac{7}{8}$-inch spark gap, at a distance of 8 inches, milliamperage 25, for a period of 20 minutes, the lymphatic tissues are only stimulated.

Knowledge of the effect upon lymphatic tissue of the proper dosage of x-ray has now been applied to diseased hypertrophied tonsils. The evil effects of infected tonsils upon the system need scarcely be emphasized. The common practice is to remove them surgically, with entails bleeding, sore throat, and considerable temporary discomfort to the patient.

Murphy, Witherbee, Craig, Hussey, and Sturm,[6] have reported a series of 46 cases of markedly diseased tonsils, of which only four failed to shrink considerably and cease to be toxic after one x-ray treatment as follows: the axis of the x-rays passed under the angle of the jaw into the tonsil region, three inches on either side of the neck being exposed and the surrounding surface covered with lead. In the case of children the head was fixed to insure their staying in position. An 8-inch spark gap was used, 5 milliamperes, 10 inches distant from the target, filtered through 3 inches of aluminum, and the exposure lasted three to seven minutes.

It was attempted in some cases to reduce adenoids also, with less success be-

cause, the authors think, of the difficulty of access by the rays.

In every case, clinical and bacteriological examinations were made of the throats before and at several periods after treatment. The infections were pronounced before treatment. For a time after, the bacteria increased or remained stationery; then the tissue began to shrink; the tonsils were reduced; the crypts drained; and the bacterial examinations were negative in about four weeks after the treatment.

F. H. Williams,[7] following up these experiments used radium successfully instead of the x-ray. The advantage of radium is that it may be put inside the mouth screened on three sides to radiate the tonsils or adenoids only, which does away with the probable damage to the lymph glands of the neck caused by x-rays passing through the neck.

This method of treatment is new; and with such powerful and little known agents as radium or the x-ray one should be very careful. We must limit the extent of our experiments with human subjects. The observation has not been sufficiently long as yet to determine whether or not we shall have recurrences and reinfections too frequently to make the method worth while. Furthermore, the shrunken atrophic tonsil is often an arch offender. Nevertheless, this new treatment offers a possibility of being an immensely valuable means of therapeusis, which will, if it continues to be as successful as the Rockefeller Institute has found it, be the simplest means of combatting chronic tonsillar infection. There must be more reported cases, and the treatment and results in every case must be accurately described.

A further possibility suggested is that the tonsils may have a function in increasing our immunity to disease, a function which we have not hitherto seriously enough taken into account. Thus a possible objection to their complete extirpation might then be offered.

1. Murphy, J. B.: J. A. M. A., 1914, LXII, p. 1459.
2. J. Exp. Med., 1915, XXII, p. 204.
3. Ibid., 1917, XXV, p. 609.
4. Taylor, Witherbee, Murphy: J. Exp. Med., 1919, XXIX, p. 53.
5. Thomas, Taylor, Witherbee: Ibid., p. 75.
6. J. Exp. Med., June 1, 1921, p. 815.
7. Williams, F. H.: Treatment of Hypertrophied Tonsils by Radium; Boston Med. & Surg. J., 1921, CLXXXIV, 10, P. 257.

TAKING STOCK

Take stock! Wanamaker does it, and so does Tony on the corner. Each from time to time finds out what wares he has sold, and what assets he has on hand. The physician, who sells brains, is under no less necessity of estimating the quantity and quality of the goods he keeps: and no less than the shrewd dealer of commerce who guards the character of his merchandise, the doctor should select the sources of his knowledge, and gain his information under a well laid plan.

Philosophers tell us that the faculty of judgment is dwarfed in nearly all persons. Of all classes, the medical man, perhaps, requires it most, although as he himself is quick to admit, he has little enough leisure for its development. As a result, the opinions of others are eagerly borrowed, particularly those which come easy to hand. It is much as if one in a shower took the nearest umbrella, regardless of whether or not the top was sound enough to keep off the rain.

This tendency in all human beings is the fountain from which rumor runs; it explains the rapid and wide spread of errors, and the fame of what is bad; it is the reason that highly commercialized pharmaceutical firms find it profitable to support detail men who give post-graduate lectures on medicine to the physician in his office; it is the law taken advantage of when the mail is burdened with clever

booklets, excerpts, gazettes, bulletins, memo pads, blotters, diet lists, et cetera, which with consummate art train the physician to practice for some manufacturer's profit. Superficial thinking is easy thinking; epitomized and glittering sophistries allure; as the trout rises to the painted fly, so, too often, the doctor is hooked by the attractive bait thrown out by those who profit by short sighted physicians following the paths of least resistance.

Opportunities for self improvement in science are so sparingly measured out, who can afford to squander them? Commercial purveyors of medical education give as a rule only false wares. Let us, taking stock from time to time, be reminded that a small quantity of good quality achieves more than a large quantity of bad quality, and is cause for pride; and that the seeker after such mental equipment has patients who are more than guinea pigs, and a practice which is no proving ground for the wonderful (?) new preparations of Messrs. XYZ.

The Hot Springs Meeting

THE ATTRACTIONS OF HOT SPRINGS*

By Walter J. Hebert,
Hot Springs, Ark.

It seems extremely appropriate that the next annual convention of the Southern Medical Association is to be held at "The World's Greatest Sanitarium." Physicians from all parts of the Southland send people to Hot Springs National Park for treatment and still many of these doctors have never visited the place that they feel will prove of such great benefit to their patients. On the other hand there are many men of the medical profession in the South who know almost nothing regarding the great health resort of Arkansas. The golden opportunity is now presented to the physicians of Dixie of visiting Hot Springs, gaining first hand information concerning its claim to fame, and at the same time of attending the annual meeting of their medical society.

*From the Sub-Committee on Publicity of the General Committee from the Hot Springs profession.

Certainly the Southern doctor should be vitally interested in a place that possesses water of such curative value that the United States government has seen fit to take complete control of the land on which it is located. They may also profit by visiting a City that entertains 150,000 visitors annually and sends back to their homes thousands of happy and healthy people who were once the victims of some dreaded disease.

A BIT OF HISTORY

Hot Springs has an interesting and romantic history, being linked up with many Indian legends and stories of Spanish explorers. The credit of having discovered Hot Springs is given to De Soto, although it was not until after the visit of Hunter and Dunbar (members of the Lewis and Clark expedition) that many people began coming to the famous resort. These two explorers were astounded at the natural beauty of the place. They also marveled at the wonderful springs in which they were able to cook their meals without the use of fire, and as a result they spread the news of their visit to Hot Springs far and wide.

Famous Bath House Row—Magnesia Promenade

One of the old Indian legends tells us that the members of many tribes, who were continually at war with each other, frequently buried the tomahawk and came to Hot Springs to bathe in the "Fountain of Youth." These hot waters were considered the work of the "Great Spirit" and were held sacred by all of the savages.

In 1832 Congress set aside a reservation at Hot Springs and so it was that our first national park came into existence. From that time on improvement after improvement has been made at the resort until today it is the beauty spot of the southern Ozarks and "the playground of America."

WORK OF THE GOVERNMENT

The United States government has been unusually active in behalf of Hot Springs. Beautiful drives have been constructed on the mountains that surround the City, the Army-Navy Hospital, which returns ninety-five per cent of the soldiers and sailors sent here for treatment fit for active service, is located on the slope of Hot Springs Mountain. Many of the hot springs have been inclosed in small concrete houses, and

numerous fountains and buildings have been erected.

Protection of the visitor to Hot Springs has also been taken up by the Government and one of the principal actions taken, in respect to this important matter, is the keeping of a complete list of competent or registered physicians at the office of the Superintendent of the Reservation. Any visitor who does not know what doctor to consult after arriving in the City can secure this list and make his own choice therefrom.

Another plan followed by Uncle Sam is direct supervision over the bath houses. For example, a limit is set as to the price that can be charged for a course of baths at any of the houses.

THE FAMOUS BATH HOUSE ROW

Probably the greatest attraction at Hot Springs and the one of which more is spoken and written than all of the rest combined is "bath house row."

A line of magnificent and stately buildings, in a class with some of the most palatial public structures in America, bath house row is the pride of every resident of Hot Springs and the admiration of all who visit this famous watering place. Stretching along in front of the bath houses is a wide, well paved walk shaded with beautiful magnolia trees. This walk is the renowned "Magnolia Promenade" of the resort.

Besides the ten million dollar bath house row, there are numerous other bath houses at Hot Springs which are a part of large hotels and consequently afford the convenience to many of being able to get their room, meals, and hot bath under the same roof.

The price of a course of baths, which consists of twenty-one, ranges from ten to fifteen dollars, with an additional attendant's fee of four dollars at every house.

A free bath house, for the use of those that are unable to pay for a course of baths at the other houses, is conducted by the Government on the reservation.

A CONVENTION CITY

Hot Springs is fast becoming one of the greatest convention cities in the United States. It has already gained the distinction of being known as "The Convention City of the Southwest," and it is little wonder that such is the case, because there are over four hundred hotels and boarding houses here, besides numberless cafes, and every other facility necessary for properly entertaining thousands of people.

Many large conventions have been held in Hot Springs and the delegates that attended these conventions left the City praising the manner in which they were entertained by the residents of the "Valley of Vapors."

An ideal climate the year round and the round trip railroad tourist ticket with all stop over privileges, which can be obtained at any time in the year, have also aided materially in making this resort a wonderful convention city.

MANY AMUSEMENTS

When the members of the Southern Medical Association gather here for their meeting it will not be imperative that they spend all of their time attending their meeting, taking hot baths, drinking at hot springs, or hiking over the beautiful mountain roads, because there are many amusements and points of interest in and about the City.

The 165-foot all steel observation tower, situated on the highest peak of Hot Springs Mountain, is one place in Hot Springs that every visitor, be he physician or ragman, should take the time to investigate. On clear days four states can be seen from the top of this structure and the pine perfumed breezes that are inhaled by one as he gazes out over the Ozark country below are worth traveling thousands of miles to enjoy.

The ostrich and alligator farms are also places at which the convention visitor might spend a few pleasant hours when there are no business sessions or dinners and dances to take up his time. In fact, the amusements in Hot Springs are too numerous to mention and suffice it to say that there will be no dull moments for those attending the meeting.

Hot Springs is awaiting the coming of the Southern Medical Association convention with pleasant anticipation. Preparations are being made every day for this meeting, which is still many weeks off, and by the time the big gathering convenes here every doctor that attends will learn the true meaning of Southern hospitality.

REDUCED RAILROAD RATES TO HOT SPRINGS

Special reduced round trip rates on all railroads have been granted the Southern Medical Association for doctors attending their Hot Springs meeting. This is on the Identification Certificate plan, the Certificates to be issued from the Association office at Birmingham upon request. All doctors contemplating attending the Hot Springs meeting must procure an Identification Certificate if they wish to get the benefit of this special rate. The rate is one and one-half fare for the round trip, tickets on sale November 10-16, return limit November 21.

THE GEORGIA STATE MEDICAL SPECIAL TRAIN TO HOT SPRINGS

Arrangements have been made by the Medical Association of Georgia to conduct a special train to the Fifteenth Annual Meeting of the Southern Medical Association, which will be held in Hot Springs National Park, Arkansas, November 14-17, 1921. This train, which will consist of all steel drawing room sleeping cars, compartment cars and dining cars, will leave Atlanta, Georgia, via the Seaboard Air Line Railway, at 5:30 P. M., Saturday, November 12, arrive Birmingham at 10:40 P. M., leave Birmingham via Frisco Railroad at 11:00 P. M., arriving at Memphis early Sunday morning, where a stop of several hours may be arranged for, and arriving at Hot Springs Sunday afternoon, the 13th. Our special will be personally conducted by Mr. Pat Hampton, District Passenger Agent of the Seaboard, who served overseas with the Emory Unit (Base Hospital No. 43), and who has had extensive experience in conducting parties of this character. Mr.

Hampton will remain with the party at Hot Springs to take care of the arrangements for the return trip. Special reduced round trip rate of one and a half fare has been granted by all railroads. To get this rate Identification Certificates will be issued from the Southern Medical Association office at Birmingham, Ala., to all who wish to make the trip.

All physicians of the Southeastern States who anticipate attending this meeting, are cordially invited by the Medical Association of Georgia to join them on this trip. Those from Virginia, North and South Carolina and Florida, should join the party at Atlanta, at which point the Georgia delegation will concentrate, those from Alabama joining the train at Birmingham.

It is anticipated that this will be one of the largest and best meetings ever held by the Southern Medical Association, a very large attendance being expected from over the entire Southern states.

The officers of the Association and the profession of Hot Springs cordially invite and urge the physicians to take their wives on this trip, and it is principally to accommodate them that we have arranged for compartment cars to be attached to our special train. All those expecting to make this trip should send their applications for space right away.

For further information, including all details, write Mr. Pat B. Hampton, District Passenger Agent, Seaboard Air Line Railway, Atlanta, Ga., or Dr. Allen H. Bunce, Secretary, Medical Association of Georgia, Healey Building, Atlanta, Ga.

Correspondence

CHRISTIAN SCIENCE VS. THE GONOCOCCUS

Editor, SOUTHERN MEDICAL JOURNAL:

The error of the individual is of little moment, but the fundamental or basic error is of the greatest significance, for it is universal.

The occasional report found in the "Chiropractic and Osteopathic Medical Journal"—the daily paper—which speaks of one of those worthies breaking a patient's back while making an "adjustment" for some minor complaint or manipulating a typhoid abdomen until he ruptures the intestine, is an individual error. But when Christian Science essays to cure gonorrhea, we are dealing with a fundamental error. The following are facts:

A patient, [illegible] was being treated for [illegible] was out of the city at the time. However, before his recovery was complete she returned and very promptly contracted the disease herself. She [illegible] desultory sort of way, but finally stopped them all together before she had been pronounced cured by her physician, as [illegible] Science and thereupon began to take treatments from one [illegible]

The husband was not a Christian Scientist and faithfully continued taking his treatments from a reputable urologist until he was pronounced well, and even then waited several months before indulging in marital relations with his wife. Four days [illegible] a slight urethral discharge and a burning sensation was noted. Examination revealed the gonococcus in smears. The first urine was turbid and the second glass clear. Diagnosis [illegible] also confirmed.

The natural conclusions from the above are:

1. That a fundamental error exists in Christian Science as a science of healing;

2. That despite months of this so-called Christian Science treatment applied to the wife, she nevertheless remained in the infectious stage of the disease; and

3. That the mental treatment should be applied to the gonococcus itself and not to the individual afflicted with the disease.

CHARLES J. WATTERSTON, M.D.
BIRMINGHAM, ALA., July 1, 1921.

Book Reviews

Functional Diagnosis. By Max Kahn, M.D., Morris Hirsch Kahn, M.D., and Jacob Rosenbloom, M.D., with Foreword by William J. Gies, Ph.D. 382 pages. Hagerstown, Md.: W. [illegible] (c) 1921.

The publishers have wisely presented a monographic reprint from Tice's Practice of Medicine, entitled Kahn's Functional Diagnosis. The response by the profession to this publication is but an expression of appreciation for service. This is a valuable monograph, the first of its kind, on diagnosis of diseases by study of functions of the various organs. These tests are practical, dependable, and satisfactory, and is the proper method of analyzing the symptoms presented by patients. There are various tests of the gastrointestinal functions, including secretion, motility, residuum, as well as functions of the pancreas. The liver functions are described in a practical way. There are chapters discussing the functional tests for the capacity of the circulation. There are also chapters on tests for function of endocrine glands and the kidneys. This monograph commends itself to every progressive physician.

Southern Medical News

ALABAMA

The Baptist State Hospital, Selma, to cost about $250,000, is under construction and will be finished about October 1.

Dr. J. B. Harris [illegible] Charity Hospital at New Orleans [illegible] Laboratory, X-ray Department, Mobile.

Dr. S. W. Welch, State Health Officer, Montgomery, has [illegible] Medical [illegible] Association.

Dr. Porter Stiles, Birmingham, announces offices at 612 Jefferson County Bank Building for practice of Otology, Rhinology and Laryngology including Peroral Endoscopy.

Deaths

Dr. J. O. H[illegible]

Dr. Russel McWhorter Cunningham, Birmingham, aged 66, died June 6.

Dr. John P. Houston, Edwardsville, aged 75, died in Heflin July 1 from cerebral hemorrhage.

Dr. George Washington Vines, Dadeville, aged 76, died June 1 from pneumonia.

Dr. John Baker Kelly, Kellyton, aged 85, died June 2 from cerebral hemorrhage.

ARKANSAS

Dr. W. F. Smith, Little Rock, has been elected President of the State Medical Board. Other officers elected are: Dr. W. H. Toland, Nashville, Vice President; Dr. J. W. Walker, Fayetteville, Secretary; Dr. J. T. Palmer, Pine Bluff, Treas-

[illegible] Dr. [illegible] Hospital [illegible] June 4

DISTRICT OF COLUMBIA

Dr. Isaac S. Stone, Washington, Professor Emeritus of Gynecology, Georgetown University, has been given the honorary degree of Doctor of Laws by the University.

The American Therapeutic Association will hold its thirty-first annual meeting in Washington Hotel, Washington, in September. Dr. Byron S. Price is President; Dr. A. Bern Hirsh, Secretary. Dr. Elnora C. Folkmar, 1730 Eye Street, Northwest, is Chairman of the Washington Committee.

Dr. Michael E. Gardner, Washington, has been appointed Chief of the Bureau of Preventable Diseases and Director of the Bacteriologic Laboratory of the Health Department.

Dr. J. A. Hill, New Hampshire, has been made Assistant Director of the Census.

Deaths

Dr. James L. Suddarth, Washington, aged 81, died May 25.

FLORIDA

Dr. Raymond C. Turck, Jacksonville, has succeeded Dr. Ralph N. Greene as State Health Officer. The new Board of Health is comprised of Dr. E. P. Young, Plant City, President; Charles H. Mann, Jacksonville; Dr. F. C. Moor, Tallahassee.

Dr. Joseph N. Fogarty, Key West, has been appointed Chief Surgeon of the East Coast Hospital and Florida East Coast Railway, with headquarters in St. Augustine.

Work has been resumed on a three story nurses' home at the State Hospital, Chattahoochee.

Deaths

Dr. John MacDiarmid, Deland, aged 50, died suddenly on the Atlantic Coast Line Railroad train, May 23.

GEORGIA

The Georgia School for Backward Children, Gracewood, will open soon. Dr. George H. Preston will be in charge.

Chatham-Savannah Tuberculosis and Benevolent Association, Savannah, has received a gift of $10,000 toward the building fund of the sanatorium. The gift will provide for an administration building. Necessary funds for other buildings will probably be secured soon.

The Athens General Hospital was opened June 9. Control of the institution is vested in the board of trustees composed of lay citizens. The hospital provides for twenty bed patients. An outpatient department is also in operation.

Dr. Robert Wright Houseal, Augusta, and Miss Esther May Wilcox, Baltimore, were married June 4.

Deaths

Dr. John Battle Carter, Wadley, aged 38, died in a hospital at Elco, Nevada, May 20.

Dr. Albert D. White, Gainesville, aged 59, died April 20.

Dr. W. J. Dismuke, Ocilla, aged 48, died May 13, following an operation for appendiceal abscess.

KENTUCKY

Dr. A. T. McCormack, Louisville, State Health Officer, was elected President of the Medical Veterans of the World War at their convention held jointly with the meeting of the American Medical Association in Boston.

Clinics will be held in the various school buildings in Louisville during the summer to examine and treat children who expect to enter school in September.

Dr. Urey G. Davis, Russellville, has been named first assistant physician of the Western State Hospital, Hopkinsville.

Dr. W. W. Anderson, Newport, has been appointed district relief officer of the United States Public Health Service for the states of Ohio, Indiana and Kentucky.

The following have been appointed officers of the Hospital Company, No. 137, Kentucky National Guard, to be established in Winchester: Drs. Benjamin Allison Cockrell, Major; Isaac H. Browne, Captain; Howard Lyon, Captain; George F. Doyle, Captain; Walter J. Winburn, First Lieutenant.

Dr. Samuel Black Nunnelley, Burlington, and Miss Selma Brell, North State, were married June 10.

New officers for Bath County Medical Society are: Dr. H E. Gilmore, President; Dr. J. K. Wells, Vice President; Dr H. J. Daily, Secretary-Treasurer.

Bourbon County Medical Society has elected the following officers: Dr. C. G. Daugherty, President; Dr. J. A. Stoeckinger, Vice President; Dr. M. J. Stern, Secretary-Treasurer.

Bullitt County Medical Society has elected the following officers: Dr. J. G. Dodds, President; Dr. G. W. Kirk, Vice President; Dr. R. L. Hackworth, Secretary-Treasurer.

Carroll County Medical Society has elected the following ing officers: Dr. W. S. Golden President; Dr. W. B. Messink, Vice President; Dr. F. M. Gaines, Secretary-Treasurer.

Carter County Medical Society has elected the following officers: Dr. W. A. Horton, President; Dr. L. G. Nickell, Secretary-Treasurer.

Clinton County Medical Society has elected the following officers: Dr. J. A. Sloan, President; Dr. W. A. Frogge, Vice President; Dr. S. W. Bristow, Secretary; Dr. J. A. Sloan, Treasurer.

Cumberland County Medical Society has elected the following officers: Dr. J. E. Boone, President; Dr. J. H. Myers, Vice President; Dr. J. R. Webb, Secretary-Treasurer.

Harland County Medical Society has elected the following officers: Dr. R. F. Jasper, President; Dr. G. P. Bailey, Vice President; Dr. R. J. Malott, Secretary-Treasurer.

Henry County Medical Society has elected the following officers: Dr. W. W. Leslie, President; Dr. W. F. Asbury, Vice President; Dr. W. B. Oldham, Secretary-Treasurer.

Jackson County Medical Society has elected the following officers: Dr. W. B. Hornsby, President; Dr. W. R. King, Vice President; Dr. G. C. Goodman, Secretary; Dr. F. E. Denman, Treasurer.

Larue County Medical Society has elected the following officers: Dr. C. L. Williams, President; Dr. E. L. Smith, Vice President; Dr. Leigh Maupin, Secretary-Treasurer.

Letcher County Medical Society has elected the following officers: Dr. J. D. Fitzpatrick, President; Dr. Owen Pigman, Vice President; Dr. B. C. Bach, Secretary-Treasurer.

Muhlenburg County Medical Society has elected the following officers: Dr. J. P. Walton, President; Dr. E. L. Gates, Vice President; Dr. Clarence Woodburn, Secretary-Treasurer.

Powell County Medical Society has elected the following officers: Dr. J. E. Lemming, President; Dr. R. A. Irvine, Vice President; Dr. I. W. Johnson, Secretary-Treasurer.

Robertson County Medical Society has elected the following officers: Dr. E. W. Linville, President; Dr. Alton Wells, Secretary-Treasurer.

Rockcastle County Medical Society has elected the following officers: Dr. A. G. Lovett, President; Dr. W. F. Carter, Vice President; Dr. Lee Chestnut, Secretary-Treasurer.

Rowan County Medical Society has elected the following officers: Dr. A. L. Blair, President; Dr. L. G. Robbins, Vice President; Dr. G. C. Nickell, Secretary-Treasurer.

Shelby County Medical Society has elected the following officers: Dr. E. J. Eversole, President; Dr. A. C. Weakley, Vice President; Dr. W. H. Nash, Secretary-Treasurer.

Simpson County Medical Society has elected the following officers: Dr. W. H. Williams, President; Dr. E. K. Lamb, Vice President; Dr. N. C. Witt, Secretary-Treasurer.

Deaths

Dr. Robert D. Weaver, North Middletown, aged 72, died May 18.

Dr. William Lee Hansbro, Paducah, died June 16.

Dr. Nimrod T. Clark, Olympia, aged 71, died May 24 from sepsis.

Dr. James H. Owens, Randolph, aged 71, died June 16 from heart trouble.

Dr. Robert Burns Waddy, Lexington, aged 67, died in New York May 31.

Dr. Louis A. Grimes, Concord, aged 82, died June 20.

Dr. John W. Patton, Morrilton, aged 53, died May 11.

Dr. Madison A. Bryant, Somerset, aged 82, died July 1.

Dr. Levi D. Crawford, Marked Tree, aged 62, died at Drakesboro, April 6.

LOUISIANA

Dr. Stanhope Bayne-Jones, New Orleans, and Miss Nannie Moore Smith, Baltimore, were married June 25.

Deaths

Dr. Roland Fisher Thomas, Greenburg, aged 38, died May 9 at New Orleans.

Dr. W. W. Culpepper, Crowley, aged 86, died the latter part of June in Port Arthur from injuries received when the motorcycle in which he was riding was struck by an automobile.

Dr. George R. Tolson, Covington, aged 67, died May 29, from cerebral hemorrhage.

MARYLAND

At the beginning of the next scholastic year, October 4, a new course in medical social service will be introduced at Johns Hopkins University, Baltimore. The course will be given by the department of social economics in cooperation with the Johns Hopkins Medical School. The work will

(Continued on page 38)

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HORLICK'S, Racine, Wis.

(Continued from page 664)

include lectures in various phases of psychiatric and general medical social service by members of the teaching staff.

Plans are being prepared for an addition to the South Baltimore General Hospital to cost $500,000.

Dr. G. Canby Robinson, Baltimore, has accepted the post of Professor of Medicine at the Johns Hopkins Medical School and Physician-in-Chief of the Johns Hopkins Hospital, succeeding Dr. William S. Thayer, resigned.

Dr. Allen W. Freeman, Health Officer of Ohio, has succeeded Sir Arthur Newsholme as resident lecturer in the School of Hygiene and Public Health of Johns Hopkins University.

Dr. Calvin Goddard has succeeded Dr. A. J. Lomas as second assistant director to the Johns Hopkins Hospital.

Dr. Henry John Berkley and Miss Mary Miles Jordan, both of Baltimore, were married at Chevy Chase June 16.

Deaths

Dr. Leo Karlinsky, Baltimore, aged 36, died suddenly June 13.

Dr. Joseph S. Raborg, Baltimore, aged 74, died June 12.

MISSISSIPPI

The Charleston County Medical Society was organized at Charleston recently and the following officers elected: Dr. D. G. Bardwell, President; Dr. W. E. Jinkins, Secretary-Treasurer. The meetings will be held the third Tuesday in each month.

Dr. R. J. Wilson, Meridian, has been reappointed health officer of Lauderdale County.

A new hospital for disabled service men will be opened in a few days at Gulfport under plans completed by the Public Health Service. The hospital will be equipped to take care of 500 cases. There will be attached to the hospital staff a corps of specialists skilled in treatment of neuro-psychosis patients.

Dr. C. C. Risher and Mrs. Laura McAshan, both of Laurel, were married June 7.

Deaths

Dr. John Thomas Abston, Hickory Flat, aged 62, died suddenly June 10.

(Continued on page 40)

Laboratories of

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BARIUM SULPHATE. For stomach work. Finest grade. Low price.
COOLIDGE X-RAY TUBES. 5 styles, 10 or 30 millamp.- Radiator (small bulb), or broad, medium or fine focus, large bulb. Lead Glass Shields for Radiator type tubes.
DEVELOPING TANKS. 4 or 6 compartment, stone tanks. These will end your dark room troubles. 5 sizes of Enameled Steel Tanks.
DENTAL FILM MOUNTS. Black or gray cardboard with celluloid window or all celluloid type, one to eleven film openings. Special list and samples on request. Price includes imprinting name and address.
DEVELOPER CHEMICALS. Metol, Hydroquinone, Hypo, etc.
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New Orleans

(Continued from page 38)

MISSOURI

Dr. S. F. Freeman has been added to the board of directors of the Springfield Hospital Association. The following officers have been reelected: Dr. J. R. Boyd, Dr. E. C. Roseberry, Dr. Wallis Smith and Dr. R. L. Pipkin. Other members are Dr. Wilbur Smith, Dr. Lee Cox and Dr. C. W. Russell.

The physicians of Poplar Bluff and Butler County have organized a free clinic for the purpose of free dispensation of medicine to the poor. Dr. William Spaulding was named President; Dr. J. L. Harwell, Vice President; Dr. A. R. Rowe, Secretary; Dr. J. B. Eure and Dr. I. N. Barnett, Directors.

Dr. J. W. Bruton, Ozark, has been elected Superintendent of the State Tuberculosis Sanitarium at Mt. Vernon, succeeding Dr. S. A. Newman, resigned.

Dr. J. Hoy Sanford, Muskogee, Oklahoma, has moved to St. Louis to become associated with Dr. John R. Caulk, Professor of Urology, Washington University Medical School and Urologist to Barnes Hospital.

Jackson County Medical Society has changed its headquarters from the Rialto Building, Kansas City, to the General Hospital at Twenty-fourth and Cherry Streets. The medical library owned by the Society has also been moved to the hospital.

The offices of the United States Public Health Service venereal clinic, the service health center, and the Greene County Health Association, Springfield, have been moved from Woodruff Building to 212½ McDaniel Avenue.

Deaths

Dr. W. A. Orender, Norwood, aged 74, died June 1.
Dr. Henry J. DeHaan, St. Louis, aged 63, died June 25.

NORTH CAROLINA

The Mecklenburg Tuberculosis Association organization was completed June 14. Charlotte physicians have promised to assist in promoting the Association.

At the recent meeting of the National Tuberculosis Association held in New York, Dr. W. L. Dunn, Asheville, was elected a member of the Executive Committee and re-appointed a member of the Board of Directors. Dr. Charles

(Continued on page 42)

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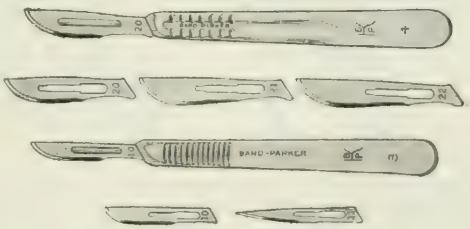

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Handles, all sizes, each, $1.00. Nos. 1 and 3 Handles fit Nos. 10 and 11 Blades.
Blades, all sizes, per dozen, $1.50. Nos. 2 and 4 Handles fit Nos. 20 and 21 Blades.
Pocket Cases for 2 Handles and a dozen Blades. Leather Cases, $1.50. Khaki Cases, $1.00.

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Pandy
Ross Jones
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Cell Count

We urge practitioners to submit spinal fluid to aid in the diagnosis of syphilis. You will be surprised at the frequency of positive results in so-called "Asymptomatic" cases.

Write for *Spinal Puncture Outfit*, also Free Containers and Literature.

Gradwohl Laboratories

3514 Lucas Ave., St. Louis, Mo.

7 W. Madison Street, Chicago, Ill.

(Continued from page 40)

L. Minor, Asheville, was also appointed a member of the Board of Directors.

Dr. Leighton W. Hovis, Charlotte, has become associated with Dr. A. M. Whisnant in the practice of eye, ear, nose, and throat.

Wayne County Medical Society has elected officers as follows: Dr. Oscar Eason, Goldsboro, President; Dr. G. B. Morris, Mount Olive, Vice President; Dr. C. F. Strosnider, Goldsboro, Secretary-Treasurer.

Erection of a large hospital near Alexander on the Garrison farm, has been started. The building will accommodate about fifty beds and will be located on a hill in the center of a 200 acre tract with a frontage of over a mile along the French Broad River. The old Alexander Hotel has been leased for twenty years and will be used for a temporary hospital.

At the recent convention of the North Carolina State Nurses Association at Wrightsville Beach the following officers were elected: Mrs. Dorothy Hayden, Gate City, re-elected President; Miss Columbia Munds, Wilmington, first Vice President; Miss Pearl Weaver, Asheville, second Vice President; Miss Anna Howerton, Charlotte, Secretary; Miss Jessie McLean, Greensboro, Treasurer.

Dr. George Lunsford Carrington, Durham, and Miss Maud Baxter, Baltimore, were married June 17.

Deaths

Dr. Richard William Wooten, Kinston, aged 72, died May 20.

Dr. M. W. Parks, LaGrange, died at Mount Olive May 31.

Dr. S. T. Satterwaite, Hendersonville, aged 72, died recently.

OKLAHOMA

Dr. William C. Vernon, Okmulgee, and Miss Emma McConnell, Springfield, Mo., were married April 5.

Deaths

Dr. Edward H. Troy, McAlester, aged 60, died May 22 from broncho-pneumonia.

Dr. Charles L. Orr, Ada, aged 60, died June 6

Dr. Andrew J. Terrill, Collinsville, aged 42, died June 4 from heart disease.

SOUTH CAROLINA

The Chester Board of Health has been reorganized with John M. Wise, Chairman. Other members of the board are Mrs. H. E. McConnell, Dr. W. R. Wallace, Dr. A. M. Wylie and Dr. George A. Hennies.

The Garnett School, Jasper County, was recently turned into an emergency hospital where thirty-five school children were operated upon for tonsils and adenoids in seventeen working hours.

Dr. James A. Hayne, Columbia, has been elected President of the State Public Health Association which was organized at the meeting of the State Medical Association held in Columbia in April.

Deaths

Dr. Thomas C. Doyle, Orangeburg, aged 55, died June 4 from cerebral hemorrhage.

TENNESSEE

Dr. J. O. Cummins, Cookeville, has associated with him Dr. B. E. Gallaher, Lawrenceburg.

A donation of $3,000,000 to the Vanderbilt University has been announced, this will be used for an endowment of the Medical Department of the University. Half this amount will come from the General Education Board, and half from the Carnegie Corporation. Funds for the erection of the new buildings will be made available from the $4,000,000 appropriation made by the General Education Board in 1919. Plans for the removal of the medical school and the erection of an entirely new plant on the west campus will be projected and executed with all possible speed, and it is hoped that the buildings will be completed and ready for occupancy by the fall of 1924.

Dr. Elizabeth C. Kane, Memphis, announces the removal of her offices to 933 Peabody Avenue, and the opening of a Nursing Home for the care of convalescents, rest cures and obstetrical cases.

Drs. Alfred B. DeLoach, Memphis, and Benjamin L. Simmons, Nashville, have been reappointed as members of the State Board of Medical Examiners. Other members of the board are: Dr. Charles A. Abernathy, Pulaski; Dr. Nathaniel T. Dulaney, Jr., Bristol; Dr. William L. McCreary, Knoxville; Dr. Harley W. Qualls, Union City.

(Continued on page 44)

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RADIUM of highest purity in any quantity.

Patented glazed plaques
for superficial condition.

Tube and needle applicators
for deep therapy.

Apparatus for radium emanation
installed by our Dept. of Physics.

All our applicators and apparatus adopted after having been proven therapeutically practicable.

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Our Departments of Physics and Medicine give instruction in the physics and therapeutic application of Radium.

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THE SEARCY TONSILLECTOME

A new instrument which combines all the advantages of the guillotine with the ecraseur action of the snare. By means of the crusher, slowly applied, there is a minimum of hemorrhage.

Made by

V. MUELLER & COMPANY

Surgeons' Instruments,

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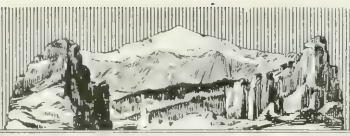

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FLAT APPLICATORS
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APPLICATORS
of SPECIAL DESIGN

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INSTALLATIONS
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EMANATION APPARATUS

SOLD ON BASIS OF
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BUREAU OF STANDARDS
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BRANCH OFFICES

122 SOUTH MICHIGAN AVE CHICAGO
50 UNION SQUARE NEW YORK
LONDON
PARIS

(Continued from page 42)

The last legislature passed a law excluding children having tuberculosis from attending the public schools of the state, and providing that under certain conditions the City or County Board of Education shall make provision for their education.

Dr. Douglass Haggard, Nashville, and Miss Onie Kennedy, Troy, S. C., were married in Calcutta, India, March 25.

Dr. James G. Eblen, Lenoir City, and Miss Annie Whittle, Whittle Springs, were married July 12.

Deaths

Dr. Nelson I. Hess, Bells, died May 14.

Dr. Van O. Edmundson, Bethel, aged 60, died May 19.

Dr. M. E. Neely, Walterhill, aged 78, died May 25 from heart trouble.

TEXAS

Mr. and Mrs. Williams, Galveston, have made a gift of $25,000 to be used for the creation of two scholarships—one for the Texas Woman's College and one for the Medical College of the University of Texas, Galveston. This gift was in honor of their son, Wingo, who completed his course in Texas University and at the Medical College at Galveston. The fund is to be known as the Wingo Williams Memorial Scholarship Fund.

Recently a woman's auxiliary to the Hunt County Medical Society was organized. The following officers were elected: Mrs. J. W. Ward, Chairman; Mrs. S. D. Whitten, Recording Secretary; Mrs. W. B. Reeves, Corresponding Secretary; Mrs. A. S. McBride, Treasurer.

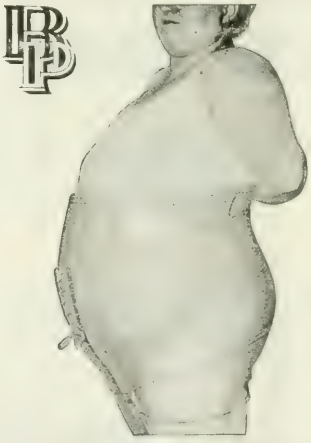
Physicians of Abilene have purchased a building which is to be used as an emergency hospital. The building will

(Continued on page 46)

BOLEN

ABDOMINAL SUPPORTERS AND BINDERS
(PATENTED)

FOR MEN, WOMEN AND CHILDREN



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Descriptive literature mailed free upon request

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THE NATIONAL PATHOLOGICAL LABORATORIES OF CHICAGO, ST. LOUIS, DETROIT AND NEW YORK are Diagnostic Institutions, ideal in equipment and personnel. The Directors of the Laboratories are always at your service for personal consultation in all diagnostic problems.

The following are a few items from the fee list:

WASSERMANN TEST (Blood or Spinal Fluid) - - - - - - **$5.00**

We do the classical test. Any of the extracts modified tests will be made upon request, without additional charge. Serum collections, with test, gladly given upon request.

EXAMINATION OF PATHOLOGICAL TISSUE - - - - - - **$5.00**

[illegible] be part of the clinical record of all patients.

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We culture all specimens aerobically and anaerobically and isolate the offending organisms. Pipettes for collecting material for autogenous vaccines sent upon request.

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offers the highest class of consultation service on moderate fees. Appointments may be made from 9 a. m. to 5 p. m.

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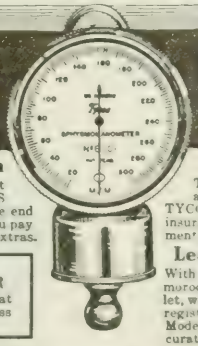
RENT THIS TYCOS NINE MONTHS THEN IT'S YOURS



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Pay for your Tycos in the same manner that you paid for your Liberty Bonds, Red Cross and Y. M. C. A. Pledges

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There is only one standard of the world—reliable—dependable—accurate—and that is the TYCOS, which has been adopted and is used by all insurance companies, the United States Government and medical authorities.

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With each TYCOS we give you free a handsome morocco leather case and a 44-page instruction booklet, which tells exactly how to use it. The TYCOS registers both systolic and diastolic pressures. Modern scientific diagnosis demands the aid of an accurate instrument for determining blood pressure.

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$2.50 Cash With Order Brings It. We will send it to you upon receipt of only $2.50 and allow you ten days free trial. If then you wish to keep it, simply pay the balance, $22.50, in nine small monthly payments of $2.50, and the instrument is yours. You cannot buy it for less anywhere else. You cannot buy it on such easy terms except by the Aloe Easy Rental Purchase Plan.

Ten Days Free Trial Just enclose first month's rent—$2.50 and we will ship the TYCOS at once. Try it thoroughly for ten days. Give it every test you can. If you are willing to part with it, send it back at our expense and get your money. If pleased, then pay only $2.50 a month for 9 months. SEND FOR YOUR TYCOS TODAY. Do it NOW. Let it PROVE it is useful to you. It is no easy to own that you'll never miss the money.

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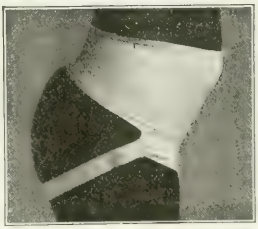
PATENTED



A washable Abdominal Supporter adapted to the use of men, women and children for any purpose for which an abdominal supporter is needed. For General Support—as in Visceroptosis, etc. For Special Support—as in Hernia, Relaxed Sacro-Iliac Articulations, etc. For Post-Operative Support—as after operations upon the stomach, gall bladder, etc.

Illustrated descriptive folder with samples of materials and physicians' testimonials will be forwarded upon request.

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Science is defined as "systematized knowledge"— —then professional protection is a science.

Dear Sirs:

We want to express our appreciation for the services rendered us in our recent case.

We feel that the success of this case is due entirely to the wonderful defense. As medical men we followed your technique very closely and we wish to say that, in our opinion, you have a talent for this type of cases unequalled by any one. Not once during the entire trial was it necessary to assist in technical questions; not once was the strict rules of medical ethics broken, or the plaintiff's attorney allowed to do so. The courteous manner of handling the witnesses and jurors was also a deciding point in the case. You have a very clear understanding of the law, in our opinion, and a very clear understanding of the relationship of the honest physician to his patient.

This is a victory not only for the Medical Protective Company, and our firm, but for the entire medical fraternity. It should teach some of our legal brethren a sense of the proper proportion of things, especially the difference between the natural unpreventable hazards encountered in the practice of medicine and the cases of real malpractice.

Yours very truly,

The Medical Protective Co.
of
Fort Wayne, Indiana

(Continued from page 44)

be furnished with modern equipment including x-ray and operating appliances.

The Drs. Moore are going to erect a hospital at Vernon to cost about $35,000

Deaths

Dr. Francis Bates Sewall, Marlin, aged 40, died June 5.

Dr. Allen G. Neathery, Gainsville, aged 59, died May 30 from cerebral hemorrhage.

Dr. Rufus G. Williams, Dallas, aged 76, died May 24.

VIRGINIA

A motor ambulance, costing about $3,000, has been presented to the Memorial Hospital, Winchester. The gift was made by residents of Winchester and Clarke and Frederick Counties.

The new addition to Stuart Circle Hospital, Richmond, was opened on June 6. It has facilities for the accommodation of from forty to fifty patients.

The South Piedmont Medical Society has elected the following officers: Dr. Elisha Barksdale, Lynchburg, President; Drs. F. J. Gregory, Keysville; C. L. Bailey, Danville; R. H. Fuller, Clover; D. P. Scott, Lynchburg, Vice Presidents; Dr. George A. Stover, South Boston, reelected Secretary-Treasurer.

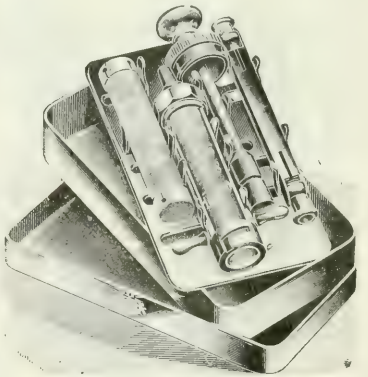
The new hospital in Hopewell which is to be conducted by Drs. D. L. and J. N. Elder, Hopewell, and Dr. H. Aulick Burke, Petersburg, was opened in June.

A ten-acre tract of land near Danville has been purchased from Dr. L. L. Vann as a site for the new home of the Danville Tuberculosis Sanitorium. The building will be erected at a cost of approximately $50,000. The sum was raised by popular subscription.

The Norfolk Medical Society has elected the following officers: Dr. J. C. Andrews, President; Dr. J. L. Rawles, Vice President; Dr. Lockburn D. Scott was reelected Secretary.

(Continued on page 48)

The Astra Syringe



FOR HYPO AND SERUM INJECTIONS

An all metal and glass syringe constructed without solder or washers. All parts are interchangeable and can be sterilized by boiling. The syringe can be had separately or in a metal case with extra barrel and plunger.

(Write for our special circular of Syringes and pieces.)

THE MAX WOCHER & SON CO.
Surgical Instrument Makers
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Ease and Comfort in Walking

Medical men, in recommending walking as an exercise, should not overlook the advantages of

O'Sullivan's HEELS

The soft cushion-like step and notable absorption of shock that result therefrom give a new character to walking. Jarring is relieved and the gratifying decrease of fatigue and nerve-tire make it possible for many a person to take long walks with an ease and comfort never enjoyed before.

Many a physician has found that O'Sullivan's Heels are of immeasurable value to those who seek the full benefits from the outdoor life.

O'SULLIVAN RUBBER CO., Inc., New York City

A Rational Procedure in Summer Diarrhea

For Infants of any age

Mellin's Food
4 level tablespoonfuls

Water (boiled, then cooled)
16 fluidounces

Give one to three ounces every hour or two, according to the age of the baby, continuing until stools lessen in number and improve in character.

Milk, preferably skimmed, may then be substituted for water—one ounce each day—until regular proportions of milk and water, adapted to the age of the baby, are reached.

NOTICE

SHERMAN'S VACCINES

ARE NOW SUPPLIED IN A NEW 10 MIL.
(C. C.) CONTAINER

This package has many superior features which assure asepsis, prevent leakage and facilitate the removal of contents. It is constructed on the well known Sherman principle.

The vial is amply strong which prevents breakage so frequent with shell vials.

We are exclusive and pioneer producers of Bacterial Vaccines. Originators of the asceptic bulk package. Pioneer in elucidation, experimentation and clinical demonstration.

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1000 PRESCRIPTION BLANKS $2.50
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1000 Professional Cards	$4.50
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Prices include parcel post charges
A few samples free
A. H. KRAUS
407-409 Chestnut St. Milwaukee, Wis.

(Continued from page 46)

Miss Sara Earhart, formerly superintendent of a Lynchburg hospital, has been appointed public health nurse for Roanoke County.

Dr. Karl S. Blackwell, Richmond, has been elected Vice President of the Richmond Chapter of the Randolph Macon Alumni Association, recently organized.

At the recent meeting of the Society of Colonial Wars in the State of Virginia, held in Richmond, Dr. Alexander G. Brown, Jr., was elected surgeon and member of the Council.

Dr. James Morrison Hutcheson and Miss Margaret Erskine Miller, both of Richmond, were married June 11.

Dr. John Lewis Rawls and Miss Azzie Jueldah Garling, both of Suffolk, were married June 2.

Dr. John S. Weitzel and Miss Marie H. Woods, both of Richmond, were married May 18.

Dr. James Fairfax Fulton, Staunton, and Miss Martha Alexander Bell, Lewisburg, W. Va., were married June 18.

Deaths

Dr. Allen D. Evans, Christianburg, aged 52, died suddenly May 17 while returning from a visit to a patient.

Dr. William B. Daniel, Disputana, aged 81, died at Richmond June 12.

WEST VIRGINIA

Dr. W. H. Howell has taken over the management of the new Methodist Hospital at Spencer. A new staff of nurses has been engaged and will be under the supervision of Miss Della Cooper. Plans have been made to start a training school for nurses at the institution this fall.

Dr. John C. Hupp, Elm Grove, has been re-appointed Health Officer of Ohio County for the next four years.

Dr. Benjamin J. Read and Miss Chloe Dymple Spriegel, both of Red Jacket, were married June 8.

Dr. Charles Hutchison, Martinsburg, and Miss Nancy Reid, Chatham, Va., were married recently.

CLASSIFIED ADVERTISEMENTS

GRADUATE NURSE WANTED for eighteen months' course in hospital laboratory. Diploma as graduate technician granted at end of course. Address Dr. Walter C. Jones, St. Vincent's Hospital, Birmingham, Ala.

PATHOLOGIST WANTS POSITION—Has had ten years' experience. Expert in Bacteriology, Clinical Diagnosis, Physiological Chemistry, Seriology. Competent to do all laboratory work, including x-ray. Studied at leading institutions. Available at once. Address L. J. S., care Southern Medical Journal.

GUINEA PIGS AND RABBITS—Laboratory purposes, strong, healthy stock, pigs 8 to 10 ounces $1.00, 12 to 14 ounces $1.25 and 16 ounces up to $1.50. Nice breeding sows $1.50 each. Young mature rabbits 4 to 8 pounds, 50c per pound. E. L. Harris, 1512 East Main St., Chattanooga, Tenn.

DOCTOR: Write or Wire
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ATLAS BLOCK, CHICAGO

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Hip, Thigh or Leg Set. Splints Rented Ready to Apply. Your Treatment of Patients, In or Out of Bed, Secures Good Bone Union, Comfort, Strength and Health in the Least Time with the Ambulatory Pneumatic Splint.

Specify it and our "Ambumatic" Washable Abdominal Supporters.

Adjustable for uplift or Binder, to any part of abdomen. Once used always prescribed.

Send for Order Blanks, Sample Materials, Literature, Prices, etc.

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are not "cures."

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Infant Feeding *Diet Materials*

OUR AIM IS TO SERVE TO DESERVE

"SERVICE" is the keynote of our success. Through Service we have made friends with the medical profession who prescribe

MEAD'S DEXTRI-MALTOSE

in their infant feeding work. We depend upon the gratifying results obtained with Dextri-Maltose, cow's milk and water to win the physicians' confidence in our products.

We never tire of serving our friends, and would enjoy the privilege of furnishing you with the following:

Physician's File Box — Containing data on Diarrheas, Constipation, Regurgitation, Curds, Supplemental Feedings, Diets for Older Children, Diets for Nursing Mothers, Slide Feeding Scale, Prescription Blanks, etc.

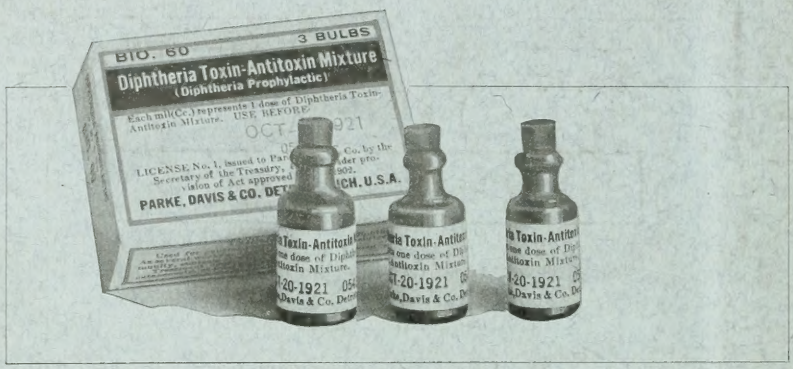
Instructions for Expectant Mothers—A little booklet, which saves the physician many moments of valuable time in giving verbal instructions which are often forgotten by his patient. The booklet contains no advertising or mention of our products, and its sole purpose is to assist the physician.

Glad to send Samples also.

THE MEAD JOHNSON POLICY

MEAD'S INFANT DIET MATERIALS are advertised only to the medical profession. No feeding directions accompany trade packages. Information regarding their use reaches the mother only by written instruction from her doctor on his own private prescription blank.

MEAD JOHNSON & COMPANY
EVANSVILLE INDIANA, U.S.A.



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Prophylaxis against Diphtheria

DIPHTHERIA TOXIN-ANTITOXIN MIXTURE (Diphtheria Prophylactic) is a mixture of Diphtheria Toxin and Antitoxin prepared according to directions laid down by Von Behring, Park and others.

Indications for use:

1. For general prophylaxis against diphtheria in schools and communities, excluding immediate contacts.

2. For permanent immunity against infection for individuals not recently exposed.

3. In conjunction with a prophylactic dose of diphtheria antitoxin for those who are exposed to diphtheria and desire a longer protection than would result from antitoxin alone.

Contra-indications: (1) It should never be used as a treatment for diphtheria. (2) It should never be used as an immunizing agent for an individual recently exposed, unless a prophylactic dose of diphtheria antitoxin is given at the same time.

Diphtheria Toxin-Antitoxin Mixture (Diphtheria Prophylactic) is given in three subcutaneous injections of one cubic centimeter each, at intervals of about five days. It is supplied in cases of three 1-cc bulbs, without injecting attachment.

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